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World Survey of Civil Aviation

SOUTH AMERICA

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World Survey of Civil Aviation

SOUTH AMERICA

1962

U.S. DEPARTMENT OF COMMERCE
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Foreword

This is the seventh in a series of foreign market surveys of civil aircraft and aeronautical products throughout the world. Previous publications have covered Japan; Africa; Southwest Asia; the Near and Middle East; selected Asian countries and Oceania; and Mexico, Central America, and the Caribbean Area. The series discusses aircraft fleet composition and commercial and general flight operations. Special emphasis is given to market potential, trade and investment opportunities, and competitive factors affecting sales of U. S. aircraft and aeronautical products.

Special appreciation is extended to the following members of the U. S. Foreign Service and others at Foreign Service posts abroad who supplied the basic data:

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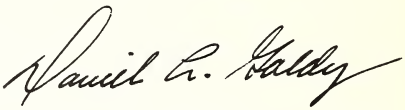

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August 1962

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South America: An Overall View

The 10 South American Republics have a total area of almost 6.7 million square miles, close to twice that of the United States, and a population of more than 138 million. Minerals and petroleum are abundant. A wide range of agricultural products is grown. A vast hydroelectric power potential exists for industrialization. At present, however, the economies of many of the countries are based on the generally limited production of only a few commodities. Economic growth is hampered by geographical factors. The area's rought terrain limits agricultural development and leaves many sections not readily accessible, thus narrowing markets. Good transportation facilities, abundant power, appropriate raw materials, and greater investment capital are vital for competition in the world market.

THE ROLE OF AVIATION IN SOUTH AMERICA'S FUTURE

Air service is important in South America. Regional specialization in agriculture, forestry, and livestock raising as well as the long distances between population and industrial centers contribute to its importance. The surface transportation systems in many areas are inadequate because of impassable terrain. Lack of funds, outdated equipment, and insufficient repair facilities also limit surface systems. A substantial improvement of transportation, which will take many years, will increase the number of markets and will encourage greater production.

Commercial aviation is encouraged by Government ownership or subsidization of airlines. Because of the availability of World War II surplus transport aircraft, the commercial airlines and air taxi operators have expanded operations considerably. However, some companies overexpanded and have collapsed, and many of the surviving ones have been forced to merge.

To maintain their competitive position with foreign flag carriers, the international carriers are purchasing jet or turboprop equipment; their displaced multiengined piston equipment is being used on expanded domestic and interregional routes. Many aircraft the size of the Douglas DC-3 will continue to be used because of inadequate facilities for larger planes except at the major airfields.

Several regional groups are interested in improving domestic and international transportation services. The Latin American Air Transport Association *(Asociacion Latinoamericana de Transportes Aereos*—ALTA), a group of small air carriers organized in 1958, proposes to promote safe, efficient, and eco-

nomical Latin American commercial aviation operations in cooperation with the Governments of the associated enterprises, the Organization of American States, the International Civil Aviation Organization (ICAO), and similar groups. Similar objectives are expressed by the Interamerican Air Transport Confederation *(Confederacion Interamericana de Transportes Aereos*—CITA), composed of lines not belonging to the International Air transport Association (IATA).

The Governments and airline companies of the countries are tentatively considering the establishment of a joint company, the Latin American Air Fleet *(Flota Aerea Latino Americana*—FALA), which will offer international service. The member states will pool their international equipment and resources. The pooling arrangement is considered to be a desirable long-range solution for meeting international competition.

General aviation activities are increasing, especially air taxi, charter, crop dusting, and cargo operations. The light plane industry in Argentina and Brazil, now limited, will probably grow, but not for sometime will it offer significant competition to foreign aircraft.

AIRCRAFT IN USE

About 6,700 civil aircraft are registered in the South American Republics. More than 5,300 of them are U. S. made. Commercial airlines use more than 850 planes, mostly multiengined transports. The rest are mostly single-engine utility aircraft used in general aviation activities.

MARKET POTENTIAL

U. S. exports of aeronautical products to the South American Republics were valued at about $46 million in 1961, almost $33 million in 1960, and more than $19 million in 1959. The 1959 shipments followed the downward trend of U.S. world exports of aeronatuical products in that year. In 1959, 352 civil aircraft were exported, valued at $17 million; in 1960, 535 at $29 million; and in 1961, 648 at $42 million. Shipments of aircraft of 30,000 pounds and over, empty airframe weight, increased in value from $4.5 million in 1959 to almost $21 million in 1961. Used commercial and civilian aircraft accounted for a considerable portion of the exports in the 1959-61 period. Only utility aircraft, 4 places and more, showed steady growth in this period, increasing from 150 units at $2.9 million to 417 at $8.9 million.

The market for U. S. surplus piston-engine transport aircraft is limited because the large number of piston-engine planes displaced by the major airlines' acquisition of jets will meet most of the domestic demand. The large market potential for light and medium utility aircraft is apparent from the U. S. export figures.

Aircraft of this type are ideal for serving remote areas in which landing facilities cannot accommodate large aircraft and to which other means of access are not available.

U. S. aircraft, parts, and accessories are usually preferred, and U. S. suppliers have the largest share of the market. However, tariffs, surcharges, import and exchange licenses, and advance deposit requirements in many of the countries restrict U. S. sales. Nevertheless, the region's large size, irregular topography, and inadequate surface transportation and communications suggest a market potential for more aeronautical equipment.

Argentina

Argentina has an area of more than 1 million square miles and a population of nearly 20 million. The topography forms three areas: The Andes Mountains in the west, the vast rolling Pampas (plains) in the central region, and the rugged Patagonian Plateau in the south. The major economic activities, in order of importance, are agriculture, stockraising, and manufacturing.

ROLE OF AIR TRANSPORTATION

The role of civil aviation in Argentina differs from that in many South American countries because domestic surface transportation to most areas is satisfactory. Nevertheless, the importance of civil aviation has increased because of the long distances between major domestic industrial and population centers, between the cities and the cattle-raising and agricultural centers, and between Buenos Aires and major cities in other countries.

Ocean carriers transport most of Argentina's foreign trade; a small amount is carried by river, rail, and air to neighboring countries. A number of foreign flag airlines carry a major share of international passenger traffic, but all domestic traffic is reserved to Argentine airlines.

The Ministry of Aeronautics, which supervises all aviation matters, including public airport construction and maintenance, acts through the National Administration of Civil Aviation *(Direccion Nacional de Aviacion Civil)*, which, in turn, acts through the General Bureau of Air Flights and Airports, the General Bureau of Development, Instruction, and Certification, and the National Bureau of Air Transportation.

The Government authorizes and encourages the establishment of private airlines and also permits the development of air services by State enterprises. It operates the major international airline and authorizes operations of private international companies. Through the Ministry of Aeronautics it encourages aerial work connected with agriculture and livestock, assists flying clubs, and grants franchises for regular commercial air services. In these franchises, provision may be made to subsidize commercial air

services on domestic routes which the Government considers to be of national interest. Only the Government airline, *Aerolineas Argentinas*, receives a subsidy for foreign operations.

Argentina is a signatory to the Warsaw Convention (1929), governing conditions of carriage in international air transport; to the Convention on International Civil Aviation, Chicago (1944); and to the International Air Services Transit Agreement, Chicago (1944). It is also a member of the International Civil Aviation Organization (ICAO). *Aerolineas Argentinas* belongs to the International Air Transport Association (IATA).

Most of the numerous airports located throughout the country are relatively small. Ezieza Airport at Buenos Aires is the most important of the five which accommodate long-distance international carriers. The international airports are used for both commercial and private flying. Many interior fields are inadequate for scheduled service, but the Government recently approved an extensive airport development program providing for construction and expansion of approximately 45 of the domestic and international airports.

Air traffic control facilities are being improved, increasing safety. An aviation training center was established in October 1960 in collaboration with the U. S. Government's International Cooperation Administration (now the Agency for International Development). It provides modern facilities for the training of personnel in communications, airport facility maintenance, electronics, air traffic control, safety, technical English, and other subjects.

Argentina has only a small aeronautical industry. The *Direccion Nacional de Fabricaciones e Investigaciones Aeronauticas* (DINFIA), an agency of the Ministry of Aeronautics, has directed the assembly and partial manufacture of light aircraft, mostly trainers, since 1932. The actual work is carried out by *Fabrica Militar de Aviones* (FMA) of the *Instituto Aerotecnico* (IA), and production has been limited to modest numbers of military, rather than commercial, craft. DINFIA is now producing prototypes of several aircraft of its own design, in addition to the Beech Mentor 34A and the Morane Saulnier under license. Among local designs are the IA-35, a twin-engine utility monoplane; the IA-46, a single-engine utility plane, similar to the Piper Cub, designed specifically for crop dusting; and the IA-45, a twin-engine executive transport. Engines are produced for the aircraft DINFIA designs, but are imported for the others. Annual production in the past several years has totaled about 125 units. DINFIA also has extensive overhaul and maintenance facilities which are used by the military services. A high-speed delta-wing aircraft and a large 4-engine tailless monoplane, or flying wing, to be used as a cargo transport are being developed.

The first major commercial aircraft manufacturing started in mid-1960 when *Aviones Lockheed-Kaiser Argentina*, an equal partnership between *Industrias Kaiser-Argentina* and Lockheed

Aircraft International, was established. *Aviones Lockheed-Kaiser* is producing the Lockheed CL-402, a single-engine utility transport. An all-metal high-wing monoplane, the CL-402 is powered by a 260 hp. Continental engine, has accommodations for 6 passengers or 2 pilots and 1,000 pounds of cargo, and has a cruising speed of 150 mph. Production of about 100 planes a year is scheduled over a 5-year period, at the end of which the company plans to manufacture a twin-engine plane based on the CL-402. The company has announced that its planes will contain 50 percent Argentine materials in 1961, and 75 percent in 1965. The main imports will be engines, instruments, and other critical components.

A new company, AVI, S.A.I.C.yF., has been formed to manufacture light general-purpose aircraft. Its first aircraft is a multipurpose single-engine monoplane. The Government's protection of domestic manufacturers by preferential import surcharge treatment is especially important to the light utility transport plane industry which is now beginning to develop. A few small firms produce about 15 airframes a year, for which engines and other critical parts are imported.

Aircraft manufacturing is supervised by the Ministry of Aeronautics, which approves, rejects, or suggests modification of all production plans and import programs. The Ministry, through the National Administration of Civil Aviation and DINFIA, also has jurisdiction over manufacturing activities to assure that all commitments are met.

The Government favors the establishment of an Argentine aircraft industry, but the extent of its participation, so far, has been the subsidization of DINFIA. However, it exempts from import surcharge payments all aircraft manufacturing materials approved by the Ministry of Aeronautics.

AIRCRAFT IN USE

More than 1,500 of the 1,927 civil aircraft registered in April 1960 were U. S. made. The most popular U. S. makes were Cessna, Ercoupe, Luscombe, Piper, and Aeronca. Other U. S. planes included Curtiss C-46's, Convair 240's, Douglas DC-2's, -3's, -4's, and -6's, and Lockheed Super Constellations. More than 130 aircraft were used by the commercial airlines, and 122 of these were U. S. made. Approximately 900 general commercial and business aircraft were registered; the rest were privately owned.

COMMERCIAL AIRLINES

Service

Although the principal scheduled airlines chiefly provide domestic service, some engage in scheduled international operations, and one operates a nonscheduled air cargo service between Buenos Aires and Miami.

Aerolineas Argentinas, the country's largest commercial air carrier, is Government owned, operated, and subsidized and has about 40 aircraft. In addition to domestic flights to more than 50 towns and cities, it also offers flights to Uruguay, Brazil, Paraguay, Bolivia, Chile, Europe, and the United States, and plans to offer service to the Near East. In fiscal year 1961 and each of the two preceding fiscal years, Aerolineas received a subsidy to compensate for its deficit. An additional subsidy in fiscal year 1961 was used for payments due on several recently purchased De Havilland Commet IV jet aircraft.

Transcontinental, S.A., established in 1956 and the largest of the private airlines, temporarily suspended operations in October 1961. This company operated 9 aircraft: 7 Curtiss Commuters on domestic and regional routes, and 2 Bristol Britannia turboprops to the United States and Chile. Two Lockheed Super Constellations owned by Transcontinental were being leased to other operators. In 1959 Transcontinental received a subsidy for its domestic operations, but it has been in continuous financial difficulty. Reportedly, Sabena Airlines (Belgium) obtained an interest in Transcontinental in August 1961.

Aerolineas INI & Compania, S.A., started operations in January 1960, offering weekly round trip passenger and cargo service between Buenos Aires and Miami via Chile, Peru, and Panama. Its equipment consists of 1 DC-6, of 90-passenger capacity, and 1 cargo DC-4. In the first quarter of 1960, Aerolineas INI flew more than 203,000 kilometers in slightly less than 700 hours of flight time, transporting more than 4,800 passengers in addition to cargo and mail.

Transatlantica, S.A., started operating in September 1960, offering three weekly round-trip flights from Buenos Aires to Europe, via Brazil. Its equipment is 3 Lockheed Starliners. Transatlantica's operations were suspended in November 1961, and it reportedly went into receivership in late December 1961.

The following airlines offer only domestic scheduled services. *Lineas Aereas del Estado* (LADE), organized in 1950, is a subsidiary of the Argentine Air Force's Transport Command. It develops new domestic airline routes and supplements existing ones. The number of planes operated varies, but the main types are DC-3's and DC-4's. In 1959, LADE traveled more than 830,000 kilometers in 3,200 hours of flight time, transporting more than 10,000 passengers in addition to a substantial volume of cargo and mail.

Aerotransportes Litoral Argentino, S.A. (ALA), and *Austral Compania Argentina de Transportes Aereos, S.A.* (Austral), recently merged. Reportedly, Pan American World Airways, Inc. (PAA), obtained an interest in the merged company and will transfer several aircraft to it for use on a route to Patagonia. ALA started operating in March 1957, using 6 DC-3's on services between Buenos Aires and 9 cities in northeastern Argentina. In 1959 it flew more than 1.2 million kilometers in more than 5,500 hours of flight time, transporting more than 27,000 passengers. It has been partly subsidized by the Government. Austral started operating in 1957, offering domestic passenger and cargo flights between Buenos Aires and major cities in the southern part of Argentina, using 6 Curtiss Super 46-C's and 1 Douglas DC-4. It received a subsidy in 1959. In 1959, Austral transported more than 20,000 passengers over 1.4 million kilometers in 4,800 hours of flight time.

Taxis Aereos Argentinos, S.A. (TAASA), a privately owned carrier equipped with five 8-passenger De Havilland Dragon Rapides, provides services between Buenos Aires and the cities in Entre Rios Province on the northeastern border. In 1959 TAASA traveled almost 197,000 kilometers in about 1,200 flying hours, transporting more than 2,900 passengers.

Norsur Compania Argentina de Aeronavegacion, C.I. y F.S.A., uses six 14-seat Lockheed Lodestars for its operations. In 1959 it transported 10,400 passengers, traveling about 970,000 kilometers in 4,300 flying hours. It received a subsidy in 1959.

Lineas Aereas de Cuyo (LAC), which began operating in December 1959, provides services from Mendoza in western Argentina to neighboring cities and to Buenos Aires, using 2 Lockheed Lodestars. *Transportes Aereos Buenos Aires, S.A.C.I.* (TABA), a privately owned airline which started operating in August 1959, offers services south from Buenos Aires through the northeastern hump of the country, using 8-seat Beechcraft D-18's. It received a subsidy in 1959, and in that year traveled 107,000 kilometers in almost 380 hours of flying, transporting about 950 passengers. *Sociedad Argentina Lineas de Transportes Aereos* (SALTA) provides services between two cities in the northern part of Salta Province in northwestern Argentina, using two 6-passenger Cessna aircraft.

Argentine airlines make relatively few all-cargo flights, and none on a scheduled basis. Austral has operated international nonscheduled cargo flights to various points in the Western Hemisphere. In 1959 it traveled 33,000 kilometers in 109 flying hours. However, the status of this service since Austral's recent merger with ALA is not known. Transamerican Air Transport, S.R.L., operates nonscheduled cargo services domestically and on the North American continent, using 2 Curtiss C-46F aircraft.

About 20 foreign flag carriers provide additional passenger-cargo flights between Argentina and other countries. Some maintain regional services in Latin America, but most of the services

are long-distance trunk operations between Argentina, North America, and Europe.

Disposal and Reequipment Programs

Aerolineas Argentinas is authorized to purchase additional equipment. In January 1962, it received the first of 9 AVRO 748 turboprops. These short-to-medium range aircraft will be used on domestic and regional flights. Also in January the airline received the first of 3 Sud Aviation Caravelle jet aircraft, and has an option for 3 more. These planes will be used over the company's long-range domestic and regional routes. Aerolineas plans eventually to replace all its conventional piston-powered aircraft. Few of these aircraft are expected to be put on the market; the DC-3's and Sandringham's will probably be used as long as possible, then cannibalized. The DC-4's may be sold or retained for cargo service. Most of the cost of new equipment must be paid for out of normal operating revenue.

Almost all the airlines plan to expand their fleets. ALA-Austral recently purchased 4 Fokker Friendships to be delivered in 1962, and may acquire several DC-6's from Pan American World Airways, Inc.; and Aerolineas INI is negotiating for the purchase of a DC-6. Sales are limited, however, because most airlines are still in an early stage of development, private financial resources are limited, and the Government is not subsidizing additional aircraft purchases.

GENERAL AVIATION

Approximately 1,800 aircraft are registered in Argentina for general aviation activities. About 640 are owned by 137 flying clubs, and 90 by Government or state enterprises. Approximately 130 are owned by some 57 companies engaged in commercial activities, including crop dusting, aerial seeding, photography, advertising, and patrol and inspection. The rest are privately owned. The flying clubs are dispersed throughout the country, most small towns having at least one. Their activities are Government controlled and subsidized. The only flight schools are those of the clubs and the Government-operated pilot training schools in Buenos Aires. A company operating Bell helicopters has been active in locust extermination since 1947. A large percentage of the privately owned small aircraft in Argentina are used and owned by companies or persons having large agricultural land holdings. Most of the fertile land is flat and well suited for servicing by agricultural aircraft. Almost every farm or estancia has one or more sod landing strips.

MARKET POTENTIAL

The airlines use U. S. aircraft almost exclusively. U. S. makes are preferred to other foreign aircraft because of their perform-

ance, reputation, familiarity, and convenient and relatively inexpensive servicing and overhaul. No domestic carrier plans to acquire used piston planes of other than U. S. manufacture. However, competition in sales of new aircraft, especially from the United Kingdom and France, is increasing. Argentina offers a modest market for U. S. surplus piston-engine aircraft. Domestic services will continue to rely mainly on used piston aircraft because of the airlines' weak financial position and the inadequate facilities the airports now have for the accommodation of turboprop and jet planes. Aging piston planes now operating will probably be replaced by used aircraft, which will also be in demand to form or expand private airlines. A small market for used cargo aircraft will develop if the expected growth of Argentina's domestic and international air cargo traffic occurs. Because of the weak financial position of many of the airlines, rental arrangements of used aircraft may be feasible.

Although Argentina's utility aircraft market is limited by uncertain economic conditions and stiff import surcharge regulations, the U. S. utility aircraft industry considers it the second largest potential market in Latin America, especially for airplanes designed to meet the requirements of agriculture and cattle raising. Interest in commercial helicopters is developing. The need for improved communications, air traffic control, and ground handling equipment has been recognized, but budget limitations affect sales opportunities. Air transportation and general aviation are expected to continue expanding as the national economy improves. Transportation of all types is needed, and air transportation is the only adequate means of access to many outlying areas.

A 42-percent ad valorem import duty is imposed on the c.i.f. value of aircraft. Planes for the use of commercial airlines licensed to operate in Argentina may be imported duty free. New aircraft not equal or similar to those planned for national production are subject to a 20-percent surcharge; new aircraft equal or similar to those planned for national production are subject to an exchange surcharge of 40 percent of the list price at the factory at the time of import. An exchange surcharge of 150 percent is imposed on used arcraft having a maximum airborne weight not exceeding 6 tons; the surcharge is 40 percent on the cost and freight value of aircraft of more than 6 tons. Exempt from the preceding surcharges are those aircraft purchased by and for domestic use of national, provincial or municipal bodies; those purchased by Argentine commercial airlines for regular and nonregular services; those to be used for sanitation purposes if purchased by authorized enterprises; those to be used for aerial photography or survey if purchased by authorized enterprises; and those to be used for flying instruction.

Commercial airlines, total..... 135

Scheduled..... 90

Aerolineas Argentinas
- AVRO 748..... 1
- Sud Aviation Caravelle..... 1
- De Havilland Comet IV..... 4
- Douglas DC-6..... 4
- Douglas DC-4..... 6
- Convair 240..... 4
- Short Sandringham (hydroplane)..... 7
- Douglas DC-3..... 14
- Douglas C-47..... 2

Transcontinental, S.A.
- Curtiss Commuter (modified C-46)..... 7
- Bristol Brittannia..... 2
- Lockheed Super Constellation (leased out) 2

Aerolineas INI & Compania, S.A.
- Douglas DC-6 (passenger)..... 1
- Douglas DC-4 (cargo)..... 1

Transatlantica, S.A.
- Lockheed 1649A Starliner..... 2

Lineas Aereas del Estado (LADE)
(Number of planes operated is variable, consisting mainly of Douglas DC-3's and -4's.)

Aerotransportes Litoral Argentino, S.A. (ALA)
- Douglas DC-3..... 6
- Aero Commander..... 2

Austral Compania Argentina de Transportes Aereos, S.A.
- Curtiss Super 46-C..... 6
- Douglas DC-4..... 1

Taxis Aereos Argentinos, S.A., (TAASA)
- De Havilland Dragon Rapide..... 5

Norsur Compania Argentina de Aeronavegacion, C.I. y. F.S.A.
- Lockheed Lodestar L-18..... 6

Lineas Aereas de Cuyo (LAC)
- Lockheed Lodestar L-18..... 2

Transportes Aereos Buenos Aires, S.A.C.I. (TABA)
- Beechcraft D-18..... 4

Sociedad Argentina Lineas de Transportes Aereos (SALTA)
- Cessna..... 2

Commercial airlines--Con.	
Nonscheduled	43
Transamerican Air Transport, S.R.L.	
Curtiss C-46F	2
Altaire, S.R.L.	
Piper PA-18A	10
Roberto Mendivil	
Aviones	9
Aero Rural, S.R.L.	
Piper PA-18A	4
Moises Salmun	
Fairchild	2
Trabajos Aereos y Representaciones, S.A. (TAYR)	
Bell (helicopter)	13
Ryan Navion	1
Aerunion, S.R.L.	
Curtiss Commando C-46	2
General aviation, total	1,794
Aero Skoda (Super) (Czechoslovakia)	17
Aeronca	62
Auster	30
Beechcraft	55
Boeing	12
Cessna	237
De Havilland	33
Ercoupe	70
Fairchild	16
Fleet	26
Focke-Wulf	19
IA (Argentina)	120
Luscombe Silvaire 8	116
Macchi (Italy)	23
Miles Magister	18
Nord (France)	21
North American	23
Piper	649
Sikorsky S-51 (helicopter)	14
Stearman	12
Stinson	52
Taylorcraft	37
Other U.S. makes	68
Other U.K. makes	19
Other French makes	30
Other German makes	8
Other Canadian makes	3
Australian makes	1
Brazilian makes	3

Bolivia

Bolivia, completely landlocked, has a total area of about 425,000 square miles, almost as much as the combined areas of Texas, Oklahoma, and New Mexico. The topography varies from great plains in the north and east to two chains of the Andes Mountains in the west which are separated by a plateau of 12,000 feet elevation. Most of the country's almost 3.3 million population is concentrated on this plateau and in the high valleys of the Andes' eastern slopes. About two-thirds of the population earn a living from agriculture, livestock, or forestry. Although the mining industry employs only a few, it dominates the commercial life of the country. Manufacturing is limited.

ROLE OF AIR TRANSPORTATION

Air service is important because of the country's inland location and inadequate domestic surface transportation. Domestic commercial aviation has been especially important in unifying the country economically. Before air services linked the eastern plains to the western plateaus, the plains region was more closely allied with Brazil on the east and Argentina on the south than with the rest of Bolivia. The development of many of Bolivia's rich mineral and agricultural resources must rely on air transportation or await the construction of roads and railroads. Railways total about 1,500 miles. The road system totals approximately 15,000 miles, but only 2,500 miles are all-weather highways.

Bolivia also depends a great deal on aviation for international transportation. Rail connections to Pacific ports are limited to single-track, narrow-gauge lines through Chile and Peru. There are only two rail connections to Argentina and one to Brazil. The Pan-American Highway system in Bolivia is still inadequate, and inland waterways connect Bolivia only with Brazil.

The *Direccion General de Aeronautica Civil* (DGAC), which is under the jurisdiction of the Ministry of Public Works and Communications, supervises civil aviation. The Government sponsors the few aero clubs, one of which operates the national civil pilots' school. The development of commercial aviation is limited by the lack of foreign exchange and by considerable uneconomical competition and duplication of route services, especially in cargo operations.

AIRCRAFT IN USE

About 80 civil aircraft are registered in Bolivia, all but 2 of which are U. S. made. Commercial airlines operate 44 of the planes, including nineteen DC-3/C-47's and ten B-17's. The rest are used in general activities. Most planes which do not belong to the national airline are used for more than one purpose, including charter, business, and air taxi service. Various foreign companies use aircraft not registered locally.

COMMERCIAL AIRLINES

Service

The principal civil air carrier is *Lloyd Aereo Boliviano* (LAB), founded in 1925. The Government owns 59 percent of the stock, Pan American Grace Airways, Inc. (PANAGRA), 20 percent, and the Central Bank and private subscribers the rest. LAB is the only domestic civil airline maintaining regular scheduled services. It offers scheduled international service to Chile, Argentina, Paraguay, and Peru, and scheduled domestic service between three cities. LAB also provides semischeduled domestic flights to about 25 cities and occasional charter cargo-passenger flights.

It operates the major aircraft maintenance center in the country and, under government sponsorship, a training school for aviation ground personnel. Its fleet of 16 aircraft includes 9 DC-3's, 1 DC-4, 2 DC-6's, and 4 B-17's which are used exclusively for cargo services. To increase national prestige, LAB wants to add more international flights. It hopes to connect with national airlines in neighboring countries and to offer regularly scheduled flights to the United States.

Transportes Aereos Militares (TAM), part of the Bolivian Air Force and functioning under the Ministry of National Defense, also provides scheduled passenger and cargo services, using 6 DC-3's. It offers flights between La Paz and various cities in the interior, and to localities on routes considered uneconomical for other commercial operators.

Bolivia is a member of the International Civil Aviation Organization (ICAO) and has air agreements with six nations. Although one of the major air routes across South America passes through Bolivia, only the following foreign air carriers serve the country on their scheduled international flights: Pan American Grace; Braniff International; *Linea Aerea Nacional* (LAN), Chile; *Servicios Aereos Cruzeiro do Sul, Ltda.* (Cruzeiro), Brazil; and *Aerolineas Argentinas*.

In addition to LAB and TAM, the major scheduled operators, a few small nonscheduled carriers haul meat, agricultural products, and some general cargo. *Corporacion Boliviana de Fomento* (CBF), a Government cattle-raising corporation, has maintained its own air cargo service to La Paz and neighboring cities since 1945. It also provides passenger and cargo service to more than 10 cities or towns on a semischeduled basis, using 3 C-46's and 2 B-17's. *Frigorifico Ballivian, S.A.* (FBSA), a privately owned company operating since 1948, transports meat under refrigeration from about five slaughtering centers to La Paz, using 5 converted B-24's and 1 Convair L-13A. Return flights carry general cargo. *Corporacion Minera de Bolivia* (COMIBOL) is a Government owned and operated mining corporation which uses 1 DC-3 mainly for transportation of meat and other products within the south-central region. It owns and services about 6 air fields.

Yacimientos Petroliferos Fiscales Bolivianso (YPFB), a national petroleum corporation, uses 3 aircraft for transporting passengers and equipment to and from oil-development centers. *Aerovias Condor*, formed in 1958, offers nonscheduled flights, using 1 DC-3. *Aerovias Tunari* was formed in 1959 and operates 4 B-17's in an all cargo service.

LAB manages all of the approximately 30 airfields except El Alto Airport at La Paz and a group of fields along the Bolivia-Brazil air route. Only a few of the fields can accommodate large, multiengine aircraft, and most can handle only aircraft no larger than the DC-3. El Alto, the main international airport, is more than 13,000 feet above sea level and has only dirt and gravel runways. Development Loan Fund assistance has been approved and contracts are in negotiation for the construction of a paved runway, terminal apron, and taxiways, and for the purchase of light and control tower equipment to permit 24-hour operations. The lack of an all-weather hard-surface runway deters the routing of foreign flag jet equipment through the country.

A Central Aviation Shop was established with U. S. aid in 1956 to provide servicing facilities and equipment for LAB and private and semiprivate air transportation organizations.

DISPOSAL AND REEQUIPMENT PROGRAMS

No definite program is known to exist for aircraft disposal or replacement. Reportedly, LAB is interested in Fairchild F-27 or Handley-Page Dart Herald turboprops. However, the company's limited finances restrict acquisitions. Almost all aviation equipment in Bolivia is U. S. made, and U. S. replacement equipment would probably be preferred. Liberal financial arrangements must be offered in order to ensure continued U. S. prominence in this market.

GENERAL AVIATION

About 35 civil aircraft are used in general aviation activities. Six single-engine planes are operated by the Government; the rest are privately owned. The private aircraft operators also frequently offer their aircraft for air taxi or charter flights; some planes are used for business flying.

MARKET POTENTIAL

The anticipated increase in tourism and foreign investment and the development of the oil industry should stimulate air passenger and cargo transportation. Private flying has increased particularly in remote areas in which other means of transportation do not exist or are inadequate. Improved civil aviation is vital to Bolivia; it has a great potential for aiding economic development. However, the airlines' chronic lack of capital limits aircraft purchases. The small number of individuals able to afford their own

aircraft and the shortage of foreign exchange for all but the most important projects also restrict the present market.

The number of planes brought into Bolivia by private companies should increase as foreign investments grow, and even though not locally registered, they should stimulate civil aviation development. Import duties on aircraft and parts are 2 percent ad valorem.

Bolivian Civil Air Fleet—79

Commercial airlines, total		44
Scheduled		22
Lloyd Aereo Boliviano, S.A. (LAB)		
Douglas DC-3	9	
Douglas DC-4	1	
Douglas DC-6	2	
Boeing B-17	4	
Transportes Aereos Militares (TAM)		
Douglas DC-3/C-47	6	
Nonscheduled and cargo operators		22
Corporacion Boliviana de Fomento (CBF)		
Curtiss C-46	3	
Boeing B-17	2	
Corporacion Minera de Bolivia (COMIBOL)		
Douglas C-47	1	
Aerovias Tunari		
Boeing B-17	4	
Frigorificos Ballivian, S.A. (FBSA)		
Consolidated C-87/B-24	5	
Convair L-13A	1	
Yacimientos Petroliferos Fiscales Bolivianos (YPFB)		
Douglas C-47	1	
Cessna 180	1	
Cessna 310	1	
Aerovias Condor		
Douglas DC-3/C-47	2	
Cessna 182	1	
General aviation, total		35
Government, nonmilitary		6
Direccion General de Aeronautica Civil		
Vultee BT-13	1	
Fairchild C-82	1	
Ministerio de Asuntos Campesinos		
Helio Courier	1	

General aviation--Con.		
Government, nonmilitary--Con.		
Instituto Linguistico		
Piper PA-14	1	
Aeronca	1	
Helio Courier	1	
Private and business		29
Vultee BT-13A	3	
Beechcraft D-17S	1	
Cessna 170	2	
Piper J-5	1	
Piper PA-20	2	
Cessna 180	3	
Stinson Voyager	2	
De Havilland V	2	
Piper "135"	1	
Piper PA-22	1	
Cessna 172	2	
Helio Courier H-391-8	2	
Northrup L-125	2	
Lockheed PV-2	2	
Cessna 310	1	
Aero Commander	1	
Douglas C-47	1	

Brazil

Brazil, fourth largest country in the world, covers a vast area of more than 3 1/4 million square miles, 8 percent less than the United States without Alaska and Hawaii and almost 50 percent of the South American continent. Its boundaries extend for more than 14,000 miles, more than 4,600 of which are Atlantic Ocean coastline. Brazil borders on all the other countries on the continent except Chile and Ecuador. About 57 percent of the land is plateau varying from 650-3,000 feet in elevation; 40 percent is lowland; and 3 percent is more than 3,000 feet in altitude, the highest peak being almost 9,500 feet. Although most of the country is in the tropic zone, the climate of a large area is moderated by altitude or sea breezes. More than half the total area is drained by the Amazon River system. The population, about 65 million, is concentrated in the southeast, a region which is becoming increasingly urban. Although industrial growth has been rapid in recent years, agriculture, livestock-raising, and forestry still employ the greatest percentage of the labor force.

ROLE OF AIR TRANSPORTATION

Air service is important in the overall transportation system because it provides rapid passenger and cargo movement, serves

as a flexible substitute for surface systems, and connects isolated points not otherwise accessible with centers of population and industry. Air transportation has expanded quickly because of the size of the country and the inadequacy of surface transportation.

The scheduled airline service is supplemented by charter and air taxi flights. A branch of the Brazilian Air Force has initiated air service to remote domestic points, stimulating the development of commercial operations. International services are provided to neighboring countries, the United States, Europe, and the Middle East. Airlines carry a sizable share of the international passenger traffic and a small, though growing, share of the cargo traffic.

The Ministry of Aeronautics (Ministerio da Aeronautica), created in January 1941, regulates both civil and military aviation. The Directorate of Civil Aeronautics *(Diretoria de Aeronautica Civil)* is its chief civil aviation department. The Government encourages the development of private air transportation services, offering subsidies to the air carriers, providing basic airport and airways facilities, allocating dollars through the banking system for the purchase of aircraft and aircraft parts, and arranging bank loans or guarantees of loans for new plane purchases. All but one of the major civil airlines are privately owned. The older, well-established lines have permanent certificates for most of their routes. About 1,200 airports, some of which have maritime or river facilities, are provided chiefly by the local, State, and Federal Governments. Many small airports are used by both military and commercial planes. Most of the approximately 300 commercial airports are ungraded; only about 50 are paved. The improvement of air navigation aids and air traffic control equipment is underway, using U. S. technical assistance funds.

Brazil has a small-scale light plane manufacturing industry. In the 1950's a number of firms licensed by foreign aircraft manufacturers produced training planes for the Brazilian Air Force, as well as several series of original designs. These planes were subsequently released by the air force and now constitute the majority of the aircraft operated by the aero clubs. The present status of these firms is unknown. *Constructoes Aeronauticas, S.A.*, built North American AT-6 advanced trainers. *Fabrica Brasiliera de Avioes* built the M-7 and M-9 biplane and a series of Fairchild M-62 (PT-19) 2-seat primary training monoplanes. *Fabrica do Galleao* produced 2 series of Focke-Wulf aircraft, both 2-seat primary trainers and 2-engine advanced trainers, and Fairchild M-62's. *Companhia Aeronautica Paulistha* (CAP) produced 3 light single-engine 2-seaters of original design: #1 Planalto, #4 Paulistinha, and #5 Carioca. *Companhia Nacional de Navegacao Aerea* (CNNA) designed and and produced a series of light aircraft including the HL-1, -2, -4, and -6.

The *Centro Tecnico de Aeronautica* was recently established by the Ministry of Aeronautics to combine aeronautical research and development with education to further the domestic aeronau-

tical industry. Its Research and Development Division (IPD) is divided into different groups, the largest being concerned with aircraft development. This group, the *Departmento de Aeronaves* designs and manufactures prototype aircraft, the current products being a helicopter and a single-seat glider. A 5-seat turbine-powered helicopter is being developed. One individual has been designing and developing light helicopters since 1941.

The *Sociedad Constructora Aeronautica Neiva, Ltda.*, has been supplying 2-seat and single-seat sailplanes to the Brazilian flying clubs for several years, under Government sponsorship. It is also building a 2-seat light plane known as the Paulistinha 56C for the flying clubs and another version for the air force, and it is developing a new liaison aircraft. Currently, five 56C's are being delivered each month for civil use. The various versions of the 56C's use imported motors and instruments.

Several organizations in the domestic automobile industry are studying the possibility of manufacturing aircraft. These firms include *Willys Overland do Brasil, S.A.*, interested in producing light airplanes and engines; *Lambretta do Brasil, S.A.*, interested in manufacturing helicopters. *Cassio Muniz, S.A.*, for many years the Cessna representative in Brazil is interested in again manufacturing light planes.

The Government has recently created the Executive Group for the Aeronautical Material Industry (GEIMA), whose basic purpose is to stimulate the manufacture of aircraft, parts, and accessories.

AIRCRAFT IN USE

The Diretoria de Aeronautica Civil (DAC) maintains its aeronautical register in folio form and makes no copies of it. However, the Operations Division of the DAC has a list of all aircraft in the register except the 272 employed by the 15 carriers offering regular air services. This list, showing approximately 2,300 aircraft (based on data of December 1959), is not believed to give a completely accurate picture of the private civil air fleet now operating in Brazil. Reportedly, planes actually in service do not appear on the list--for example, aircraft owned by air taxi companies. Also, the list does not indicate which aircraft are inoperable, and in view of the age of many of the planes and the difficulties in obtaining parts, a substantial percentage are probably no longer in flying condition. A DAC official has estimated that more than half the planes owned by flying clubs are not operable. The records of the DAC do not give a detailed or thoroughly reliable breakdown of registered aircraft by utilization.

About 1,000 of the aircraft appearing on the list of the Operations Division are assigned to flying clubs or schools. Another 1,000 are used for private and pleasure flying, although many are probably also being used for commercial and business flying. Approximately 70-90 aircraft are in air taxi operations. A little less than 220 planes are registered by private companies or Government agencies, about 132 being operated by the Government. Some

of these planes--both private and governmental--are used primarily for crop dusting, powerline surveillance, ambulance services, and timber prospecting, and others are used primarily for personnel transport. Most are multipurpose, however. Aerial survey companies own 10 of the registered aircraft. Religious organizations own 9, all of which are probably being used in missionary activities. Of the 14 helicopters on the list, 12 belong to governmental or quasi-governmental units which are concerned with agriculture, and the rest belong to a distributor in Sao Paulo.

COMMERCIAL AIRLINES

Service

In the period 1950-58, the number of passengers carried on domestic and international flights increased from 1.7 million to 4.1 million; air cargo shipments increased from about 40,000 tons to almost 100,000 tons; and mileage flown increased from 51.1 million to 95.0 million.

The major groups operating scheduled commercial airlines are consolidations of numerous companies established in the past 30 years. They are headed by the following: *Empresa de Viacao Aerea Rio Grandense, S.A.* (Varig); *Servicos Aereos Cruzeiro do Sul, S.A.* (Cruzeiro); and *Viacao Aerea Sao Paulo* (VASP). The individual companies operating airlines are *Panair do Brasil* and *Paraense Transportes Aereos, S.A.* (Paraense).

The Varig company, founded in 1927 and one of the oldest airlines in Brazil, offers domestic services to more than 50 cities and has international flights to New York, Buenos Aires, and the Caribbean. Varig's 57 aircraft include 4 jets--2 Boeing 707-441's and 2 Sud Aviation Caravelles. The Government recently approved Varig's acquisition of the stock of *Real-Aerovias Brasilia.* This company was itself a consolidation, since 1954, of two of the most important airlines in Brazil: *Real, S.A. Transportes Aereos* (Real) and *Empresa de Transportes Aerovias Brasilia, S.A.* (Aerovias Brasilia). Real-Aerovias Brasilia controls *Empresa de Transportes Aereos Norte do Brasil* (Aeronorte), operating DC-3's on domestic routes; *Transportes Aero Nacional, Ltda.* (Nacional), and its 26-plane fleet; and *Sadia Transporte Aereos* (Sadia), operating 4 DC-3's and DC-4's. The Real-Aerovias group is one of the largest domestic airlines in Latin America. Using a total of 69 piston-engined planes, it serves more than 230 cities in Brazil and offers international service through the U. S. to Japan.

Cruzeiro and its affiliated companies, *S.A. Viacao Gaucha* (SAVAG) and *Transportes Aereos Catarinense* (TAC), reportedly operate on more than 12,000 route miles in Brazil and neighboring countries. They serve approximately 100 cities in Brazil, using 50 aircraft.

VASP merged with *Loide Aereo Nacional, S.A.* (Loide) in January 1962. VASP will be the majority owner of the new enterprise,

which includes all of the Loide subsidiaries. The merged company will serve a total of 64 domestic points and will be responsible for about 25 percent of all domestic air traffic, using a total fleet of about 70 planes. Eventually, jet aircraft will probably be acquired for the introduction of international services. For the present, the two airlines will maintain their separate identities. VASP, whose capital is held mostly by the State and municipal governments of Sao Paulo, began operating in 1935. It provides shuttle service between Rio de Janeiro and Sao Paulo and from these points to more than 30 southern and central Brazilian cities and towns. VASP has 33 planes, including 5 Vickers Viscounts. Loide started operations in 1949, amalgamated with *Transportes Aereos Bandeirante* (TABA) in 1951, and bought out *Navegacao Aerea Brasileira* (NAB) in January 1962. It operates on about 6,000 route miles in Brazil, serving 24 cities regularly and several others irregularly, using DC-3's, DC-4's and C-46's. The C-46's are used to haul workers, equipment, and supplies into areas where no other means of transportation exist, or which are so difficult to reach that bush-type air service is the only practical means of access. Loide plans to add its DC-6A's, which until recently were leased to *Panair do Brasil*, to the routes now served by its DC-4's. The current equipment modernization program is aimed at offsetting some of the advantages Loide's competitors have as owners of high-performance aircraft and larger fleets.

Panair do Brasil regularly serves more than 65 points throughout the country on its domestic routes. Its international services extend to Europe and the Middle East. Panair's 22 aircraft include 2 Douglas DC-8 jetliners. *Paraense Transportes Aereos, S.A.*, the other carrier offering domestic service, uses 3 C-46's.

Air cargo transportation is highly important because of its suitability for many types of freight moved in the country and because surface transportation facilities are often inadequate. Since 1931 the Air Transport Command (COMTA) of the Brazilian Air Force has operated the National Airmail Service (CAN). CAN has pioneered routes into the hinterland and to other countries. On 14 domestic and 9 international routes, it transports passengers, mail, and cargo in Beechcrafts, C-47's, and C-54's.

Other international services are offered by Braniff International Airways, Pan American World Airways, Inc., and 13 foreign flag carriers from Europe and neighboring South American countries. Brazil is a founding member of the International Civil Aviation Organization (ICAO) and maintains a permanent delegation at ICAO headquarters.

Disposal and Reequipment Programs

The present shortage of foreign exchange, particularly dollars, and the cumulative effects of overexpansion are limiting the Brazilian air carriers' disposal and reequipment programs. Reportedly, rising costs and the excess capacity developed in recent

years are the result of unchecked competition among the carriers. Forty percent of the total operating costs of Brazilian commercial aviation are estimated to be in dollars. The aviation companies have been faced with sharply mounting costs marked by a major increase in the cruzeiro cost of importing aircraft, spare parts, and gasoline. Because of the substantial excess capacity, the number of aircraft used by Brazilian airlines will probably be reduced.

The Douglas DC-3 and Curtiss C-46, both of which have relatively low performance, represent about 60 percent of the entire Brazilian civil air fleet, but a little less than 50 percent of the available seats, and only about 25 percent of the available annual capacity. They probably will not be eliminated, however, because they will still be needed for service to many domestic airports where runways are substandard, and because the resale market for these planes is severely limited.

One-half to two-thirds of the DC-3's and two-thirds of the C-46's will probably still be in use in 1964, a substantial proportion of the C-46's by then having been converted to all-cargo carriers. Approximately 45-65 DC-3's and 15 C-46's will gradually be disposed of by sale, scrapping, or normal attrition.

The small number of Consolidated PBY-5A's (Catalinas) now in regular service in the Amazon River area is expected to decrease by normal attrition. If the Catalinas' present routes were to be eliminated or modified, the operators would probably attempt to sell the planes.

VASP's SAAB Scandias will probably be gradually retired from service, sold, or scrapped. Although the Scandias are considered by some Brazilian authorities to be more efficient than the DC-3 or C-46, they would be hard to resell. About half of the 15 Scandias now operating will probably still be in use in 1964.

Most of the changes in the number of Convair 240's, 340's, and 440's will be brought about by normal attrition.

The Lockheed Constellation is well suited for use in Brazil's high-density markets. Panair will probably keep its 049/149 models through 1964. They are fully depreciated and the market for them, especially in Latin America, is limited. Panair has a large stock of spare parts for them, is completely equipped for maintaining them, and has acquired great experience in operating them. Eventually, Varig's 5 Super Constellation 1049-G models will be retired. The Aerovias 1049-H models are reportedly for sale.

Panair expects delivery of 2 Comets and 4 Caravelles in 1962, and has an option on 3 additional Caravelles. When all of these jets are in operation, its DC-7's will be retired or sold. Loide is undergoing an equipment modernization program and is not planning to dispose of any of its current fleet. Its 4 DC-6A's and 8 DC-4's are being renovated. Loide is also planning to purchase 3 jets, probably Boeing 720B's or 727's. Cruzeiro has purchased 4 Caravelles.

Varig tentatively plans to buy 4 more Caravelles and has ordered 2 Boeing 707's, and the new Varig group plans eventually to retire all piston equipment and to use only jets. It hopes to have a fleet of Caravelles for short hauls and Boeing 707-441's, Douglas DC-8's, and Convair 990's for long hauls.

The turboprops or jets which the companies plan to purchase are actually replacements, but are intended to help the carriers keep pace with international competition and to maintain Brazilian prestige abroad.

U. S. equipment is usually preferred. However, substantially better delivery dates on similar equipment (as in the case of VASP's purchase of Viscounts), unique equipment (as in the case of Varig's Caravelles), or substantially better financing terms for reasonably similar equipment are important factors determining final sales.

GENERAL AVIATION

About 2,300 aircraft are used in general aviation activities. The Government subsidizes the private flying clubs, which are the country's chief source of pilots. The exact extent of air taxi services is not known. These services are used mainly to supplement passenger and cargo transportation between the main cities within the various States, and to provide transportation between the large cattle ranches. They also supplement regularly scheduled services in many areas by offering flights to smaller villages. The Federal and State Governments and private pilots engage in crop dusting. Some private flying is done by plantation and ranch owners. Cruzeiro manages *Servicios Aereos Fotogrametricos Cruzeiro do Sul,* a company which operates an aerial photography and oil and mineral exploration service. The Brazilian Air Force sometimes transports medical supplies and patients.

MARKET POTENTIAL

No market for U. S. surplus piston-engine aircraft is likely because the Brazilian carriers will be attempting to dispose of the same type of aircraft. New transport equipment is in demand, and orders have already been placed with U. S. manufacturers for the majority of the aircraft to be acquired.

Brazil will continue to import light aircraft because the capacity of its infant aeronautical industry will be limited for some time. The need for engines, parts, and accessories will also continue. Demand is also good for fixed- and rotary-wing planes suitable for crop dusting, aerial survey operations, executive flying, air taxi service, and general utility work.

The market will remain largely uncertain because of the high cruzeiro cost of importing aircraft and parts. Other restrictions on aircraft and parts importation are an ad valorem import duty of 2 percent on the c.i.f. value, a surtax of 5 percent on the c.i.f. value, and a consumption tax of 3 percent on the total duty paid value. Aircraft may be imported only with the approval of the Directorate of Civil Aeronautics, and all foreign exchange contracts with the Bank of Brazil require a certificate of approval from the Directorate.

Commercial airlines, total..... 272

Varig group

S.A. Empresa de Viacao Aerea Rio Grandense (Varig)
- Douglas DC-3..... 21
- Curtiss C-46..... 14
- Convair 240..... 12
- Lockheed Constellation 1049-G..... 5
- Boeing 707-441..... 2
- Sud Aviation Caravelle SE-210..... 2

Real-Aerovias Brasilia:
Real, S.A., Transportes Aereos
- Douglas DC-3..... 8
- Convair 340..... 3
- Convair 440..... 7
- Douglas DC-6B..... 3
- Curtiss C-46..... 3

Empresa de Transportes Aerovias Brasilia, S.A.
- Douglas DC-3..... 7
- Lockheed Constellation 1049H..... 4

Nacional Transportes Aereos, S.A. (Nacional)
- Douglas DC-3..... 14
- Curtiss C-46..... 7
- Convair 440..... 5

Empresa de Transportes Aereos Norte do Brasil, S.A. (Aeronorte)
- Douglas DC-3..... 4

Sadia Transportes Aereos (Sadia)
- Douglas DC-3..... 2
- Curtiss C-46..... 2

Cruzeiro do Sul group

Servicos Aereos Cruzeiro do Sul, S.A. (Cruzeiro)
- Douglas DC-3..... 20
- Convair 240..... 10
- Convair 340..... 4
- Convair 440..... 4
- Fairchild C-82..... 7

S.A. Viacao Gaucha (SAVAG)
- Douglas DC-3..... 2

Transportes Aereos Catarinense (TAC)
- Douglas DC-3..... 3

Vasp group

Viacao Aerea Sao Paulo (VASP)
- Douglas DC-3..... 13
- SAAB Scandia..... 15
- Vickers Viscount 827..... 5

Commercial airlines--Con.	
Vasp group--Con.	
Loide Aereo, S.A. (Loide)	
Douglas DC-4	7
Curtiss C-46	5
Douglas DC-6C	4
Transportes Aereos Bandeirantes (TABA)	
Douglas DC-4	1
Curtiss C-46	3
Navegacao Aerea Brasileira (NAB)	
Douglas DC-3	8
Smith Super 46-C	8
Curtiss C-46	3
Panair do Brasil (Panair)	
Douglas DC-7C	4
Consolidated PBY-5A	5
Douglas DC-8	2
Lockheed Constellation 049/149	11
Paraense Transportes Aereos, S.A. (Paraense)	
Curtiss C-46	3
General aviation, total	2,283
Bucker-Jungmann Bu. 13	8
Auster V	15
Fairchild F-24 (20); PT-19 (49); PT-26 (5); F-22 (1)	75
Cessna UC-78 (5); 140 (76); 120 (12); 195 (15); 170 (173); 190 (13); 180 (52); 310 (8); 182 (11); 150 (2); 145 (1); 172 (38); 175 (12); 135 (1);	419
CAP* 1 Planalto (2); 4 Paulistinha (535); 5 Carioca (14)	551
Stinson Voyager (150); Reliant (18); SM-SA (1); "0" (1); L-5 (1)	171
CNNA** HL-1, -6	59
Piper PA-12 (20); J-3, -4, -5 (182); PA-14 (1); PA-16 (3); PA-11 (14); PA-15 (2); PA-17 (1); PA-18 (122); PA-20 (47); PA-22 (6); PA-23 (8)	406
Aeronca 11AC (14); 7AC (44); 15AC (18); 50C, 50F (7); Trainer (1); L-3-C (29); PC-3 (2); 65C (7)	122
Percival Proctor V (2); Gull (1); Prince (2)	5
Beechcraft C, D, E-17, -18S (20); 35 Bonanza (87); AT-11 (6); 50 Twin Bonanza (2); AT-7 (1); C45 (1)	117

* Companhia Aeronautica Paulistha.
** Companhia Nacional de Navegacao Aerea.

General aviation--Con.

Ryan Navion (19); S-T-A (3); S-C-W 145 (1)	23
Luscombe Silvaire 8 (16); A-65 (1)	17
Ercoupe 415C	13
Fleet 80 Canuck	5
Howard DGA	3
Republic RC-3 Seebee	3
DeHavilland Moth (9); 89A Dragon Rapide (1); Dove 104 (3); Heron 114 (1)	14
DeHavilland (Canada) Beaver	2
Douglas DC-3 (10); A-24 (1); C-39 (1)	12
Globe Swift GC-1	3
Taylorcraft BC 12D-65, -85, Cub	43
SECAN* Courlis SUC-10	1
Nord 1203-11 Norecrin	27
Bellanca 14-19 Cruisemaster (2); 31-42 Pacemaker (2); Senior Skyrocket (1)	5
Focke-Wulf 5 -8	6
Aero Commander 520, 560	3
Max Holste	1
Porterfield CP-50	2
Muniz M-7, -9	5
Stearman A, B-75, -76	6
Vultee BT-13, -15	16
Niess 5-FG	58
Waco	9
Junkers A50, F13	3
Curtiss W-16, C-46	3
Torres-6	1
Klemm	3
Bird-CK	1
EAY 201	1
Rearwin Sportster 7000, 8500, 9000	7
Avro Avion	1
Savoia-Marchetti SM.56	1
Caudron Aiglon 601	1
Monocoupe 90-A	1
RWD 5, 13	5
Zlin X11	1
Culver Cadet LFA	1
Miles Gemini	1
Chrislea Super Ace	1
Lockheed Lodestar L-18	2
Consolidated PBY-5	3
Akron Funk B75L	1
Boeing 247D	1
Saab Scandia	1
AISA** H.M. 310	1
Helio Courier	2
CMSA*** Casmuniz 52	1
Sikorsky S-51, -55 (helicopter)	3
Bell 47-D (helicopter)	10
Hiller UH-12 (helicopter)	1

* Societe d'Etudes et de Constructions Aero-Navales.
** Aeronautica Industrial, S.A.
*** Cassio Muniz, S.A.

Chile

Chile, bordered on the east by the Andes Mountains and on the west by the Pacific Ocean, is approximately 2,650 miles long and averages 110 miles wide. Its area of more than 280,000 square miles is a little greater than that of Texas. The population of more than 7 million is concentrated in the central third of the country. The topography includes subtropical deserts in the north, tropical rain forests in the southern central region, and cold, treeless plains in the extreme south.

The country has a fairly high standard of living and one of the most important industrial complexes in South America. Agriculture is still the chief economic activity, but manufacturing is now the principal source of income.

ROLE OF AIR TRANSPORTATION

Air transportation is important because of Chile's mountainous topography, isolation, and long distances between major domestic industrial and population centers. Reliable and speedy means of transit within the country are essential to the efficient functioning of Government and business. The developments in air traffic have been spectacular in recent years.

International and regional air services carry more passengers than ocean and rail transportation services. Domestic civil aviation has been important for years, and is steadily increasing in importance because surface transportation is inadequate and cannot compete with the time advantage of air travel. Furthermore, opening air transportation services to underdeveloped and inaccessible areas, requires less investment than installing surface transportation services would, and air services are more adjustable to changing demands and conditions.

Although air cargo transports carry less freight than surface facilities, they provide the only service into some areas of southern Chile and have operated profitably in the far north, where rail and highway services are poor and maritime facilities underdeveloped. Domestic air cargo services will probably increase, but they will have competition from the developing surface networks, which can operate more cheaply. Chile's own international air cargo services have been limited, but operations through Chile are expected to increase substantially as South America develops economically. Civil aviation has been instrumental in stimulating the country's commercial development, and the Government is expected to promote further aviation development.

Civil aviation in Chile is controlled primarily by the military authorities. Government agencies which regulate and promote civil aviation include the Civil Aeronautics Board (Junta de Aeronautica Civil); Directorate of Aeronautics; Under Secretary for Aviation in the Ministry of National Defense; Airports Section of the Planning Department in the Ministry of Public Works; Sub-

Secretariat of Transport in the Ministry of Economy; and *Linea Aerea Nacional* (LAN), the national airline. Chile has promoted civil aviation domestically by subsidizing the Government-owned airline, and internationally by encouraging foreign flag airlines to stop in the country. LAN's direct annual subsidy has been increasing recently, but it excludes the purchase price of new aircraft, for which the Government allots special funds. Private airlines are exempt from all taxes except those on ticket sales, which LAN is also required to pay. Indirect subsidies include exemptions from duties and taxes on fuel, new planes, and parts. Direct subsidies are also extended to the private flying clubs, and free maintenance services are provided them by the air force.

Chile has ratified the International Civil Aviation Convention and is a charter member of the International Civil Aviation Organization (ICAO). LAN is an active member of the International Air Transport Association (IATA). Santiago is the provisional seat of the Asociacion Latinoamericana de Transportes Aereos--ALTA (Latin American Air Transport Association), a group of smaller Latin American carriers that do not belong to IATA. Chile has bilateral agreements with Argentina, Brazil, the Scandinavian countries, Ecuador, Paraguay, Peru, the United Kingdom, and the United States.

AIRCRAFT IN USE

About 500 civil aircraft are used in Chile, and all but 10 are U. S. made. The aircraft inventory of the scheduled commercial airlines consists of 7 Douglas DC-6's, 19 DC-3's, 4 Curtiss C-46's, 4 Martin 202's, and 4 Convair 340-440's. More than 470 planes are registered for nonscheduled cargo, air taxi, crop dusting, executive, Government nonmilitary, air club, and private flying. They are mostly light, 2-4-seat aircraft.

COMMERCIAL AIRLINES

Service

The Government-owned *Linea Aerea Nacional* (LAN) is semiautonomous and is supervised by the Under Secretary of Transportation in the Ministry of Economy. LAN was established in 1932 and has grown steadily. It has complete aircraft maintenance and overhaul facilities at Los Cerrillos Airport, Santiago, and routine maintenance stations at 26 other domestic airports and 4 international airports. It owns and operates all the DC-6's, Martin 202's, Convair 340-440's, and 16 of the DC-3C's (converted C-47's) registered in Chile. In 1958 LAN accounted for four-fifths of domestic passenger traffic and two-thirds of air cargo transportation. It flies more than 15,000 kilometers of domestic routes to about 40 cities and more than 8.5 million kilometers a year on domestic and international routes. It has a domestic service be-

tween its southernmost terminal and the Tierra del Fuego oil fields, and an interregional service for which it uses DC-6's and Convairs. LAN offers the only scheduled international service, its major route being from Santiago to Miami. If jets were acquired, this route would probably be extended to New York and Europe. The company would like to offer more domestic services, using its DC-6's, and to add a DC-6 service to the U. S. west coast.

Linea Aerea Sud-Americana, Ltda. (LASA), a private airline formed in 1959, operates C-46's and offers regularly scheduled passenger flights to northern and southern Chile, some of which make additional stops en route to provide cargo service. It also provides seasonal service, November-April, to Juan Fernandez Island, 400 miles off the Pacific coast of Chile. LASA contracts for limited cargo services to Peru, Panama, Venezuela, Mexico, and Puerto Rico. A scheduled cargo service is provided from Santiago to Mendoza, Argentina.

Linea Aerea del Cobra (LADECO), a small thriving airline established in 1958, primarily serves the copper mining region of northern Chile, using 2 Douglas DC-3's. LADECO offers a scheduled summer service from Santiago to northern Chilean cities. It also provides regular service from Santiago to several major cities in the southern region. Its operations are not expected to expand.

In December 1961, Aereos Servicios Pacifico Sur (ASPAS) was formed to offer cargo service using 1 C-46.

Scheduled international passenger service to Santiago is provided by British Overseas Airways Corporation (BOAC); Royal Dutch Airlines (KLM); Scandinavian Airlines System (SAS); *Deutsche Lufthansa;* Canadian Pacific Airlines (CPA); and Pan American-Grace Airways (PANAGRA). *Aerolineas Argentinas, Aerolineas Peruanas, S.A.* (APSA), *Lloyd Aereo Boliviano* (LAB), *Panair do Brasil,* and Faucett (Peru) also provide scheduled services into Chile and offer connections to overseas carriers not entering the country.

The *Fabrica Nacional de Aeronaves* (FANAERO) was established in 1953 as a national, privately administered enterprise to manufacture certain types of aircraft, gliders, parts, and other aeronautical equipment. However, the company is now engaged only in major aircraft overhaul and the manufacture of some aircraft parts. In 1955 it constructed a domestically designed light, low-wing monoplane trainer which is being used by the Chilean Air Force, but aircraft manufacturing is limited.

Although the existing airports and airways are inadequate, the Government has a long-range program for improving them. An airport planned for Padahuel, near Santiago, will be the major international field and will accommodate jet equipment operated by the international airlines. Cerro Moreno Airport at Antofagasta can handle large international jet aircraft, but passenger facilities will need improvement. Some other airports are classified

as international, but most of them can only handle aircraft up to the size of a DC-6. Few of the 20 airports south of Santiago are paved, and passenger facilities at most are inadequate.

Disposal and Reequipment Programs

Domestic airlines do not have any definite programs for aircraft disposal. LAN acquired four of its DC-6B's in 1958, and in 1960 purchased 4 Convair 340/440's to gradually replace its Martin 202's, which are uneconomical because of the high cost and shortage of spare parts. LAN would like eventually to acquire jet aircraft. LADECO plans to purchase another DC-3 and eventually may replace the DC-3's with Convair 340's or their equivalent. LASA will probably eventually trade several C-46's for Super C-46's. The United States is definitely preferred as the source of aircraft and aeronautical equipment. However, Great Britain and France may be strong competitors in the market for jets.

GENERAL AVIATION

Government subsidized air clubs are active and popular. Approximately 56 air clubs own more than 280 small planes, and their members reportedly own over 90 additional aircraft. Pleasure flying is gaining importance as a means of crossing over Chile's rough and rugged terrain. Pilots use club aircraft for trips to the numerous domestic vacation spots. Flying at the big ranches is also considerable.

Several small groups have organized air taxi services but have had only limited success. Recently, several small companies were formed to provide charter services south of Santiago, especially during the summer vacation season, November to March. About a dozen planes, mostly 4-seaters, are used for such services; they may be chartered to fly into areas not served by the commercial airlines. The companies have the same tax exemptions as the larger carriers. The competition for this limited business is intense, and through the years a number of such ventures have failed.

Agricultural flying, now a successful small business, is expected to develop even more. In 1960, 3 firms used 17 small planes for crop dusting and, to a small degree, insect spraying of about 200,000 acres of farm land.

Business flying was developed mostly by mining and agricultural groups. Most of the 12 planes used for this purpose are Cessna 310's. The other large industrial interests and landowners that are beginning to use their own aircraft represent a potential market for utility planes.

Commercial aerial photography is limited. A Cessna 195 owned by the Ministry of Public Works is equipped for aerial photography and is used on highway construction, dam building, and other public construction projects. Some privately owned light planes are

used for such activities as aerial advertising, mineral and geological exploration, fish detection, and forestry patrol.

Several Government agencies own planes: the Ministry of Public Works has 5, and the Ministry of Lands and Colonization and the Empresa Nacional de Petroleos each have 1. The special Carabineros (police) Air Club owns about 9 aircraft, which it uses for recreation and official business.

MARKET POTENTIAL

The potential demand for certain types of aircraft, especially cargo, as well as for aircarft components and airport, air navigation, and air traffic control equipment is good. The trend toward increased use of domestic and international passenger and cargo air carriers is expected to continue. However, airport facilities must first be expanded and modernized. Noncarrier air operations are also expected to increase. Air clubs have an established popularity. As the country's economic position improves, business flying and air taxi services will expand. Aerial crop dusting will probably be done on a larger scale.

The commercial airlines are not expected to improve their fleets significantly in the immediate future. Short-haul medium-tonnage cargo aircraft which can maneuver easily in and out of the country's numerous small airfields will probably be in demand. These aircraft would be used for air taxi, ambulance, and emergency evacuation work. Reportedly, about 25 2-4-seat single-engine aircraft may be sold annually. Helicopters have not been used to a great extent; the few now operating are assigned to the air force. Civil groups find them too expensive to purchase and maintain.

Traditionally, U. S. aeronautical products are preferred. Most of the commercial transports and their spare parts were purchased from the United States. Small aircraft are purchased from U. S. manufacturers because of their comparatively low price and high quality. The general availability of spare parts and the convenience of having these planes flown in rather than being dismantled and crated for shipment from Europe are other factors in their favor. However, in order to maintain their favorable market position, U. S. suppliers will have to meet foreign competitors' easier sales terms. In addition, technical manuals should be supplied in Spanish, supplies of spare parts should be ensured, and installation and maintenance assistance should be provided.

All planes have been exempted from import deposits and duties. Chile follows ICAO air worthiness rules and regulations, but any aircraft imported from the U. S. with a U. S. certificate of air worthiness is presumed to meet all requirements and requires no additional certification.

Commercial airlines, total		39
Linea Aerea Nacional (LAN)		
Douglas DC-6B	7	
Douglas DC-3C	17	
Martin 202	4	
Convair 340/440	4	
Cessna 310	1	
Linea Aerea del Cobre (LADECO)		
Douglas DC-3	2	
Linea Aerea Sud-Americana, Ltda. (LASA)		
Curtiss C-46	4	
General aviation, total		473
Charter, air taxi, business, crop dusting, and aerial photography		42
Piper Pawnee, PA-25	3	
Beechcraft G-17-S	1	
Beechcraft D-18-S	1	
Stinson	3	
Cessna 170, 180, 310, 195	13	
Aero Commander 560-A	1	
Piper Apache PA-23	1	
Piper PA-18	14	
Beechcraft 35 Bonanza	1	
Beechcraft 50 Twin Bonanza	3	
Lockheed Azcarate L-60 (Mexico)	1	
Government, nonmilitary		16
Douglas DC-3	1	
Grumman Widgeon	1	
Stinson	1	
Cessna 190	2	
Cessna 180	1	
Cessna 310	1	
Cessna 172	2	
Aeronca L-3-B	1	
Cessna 182	2	
Beechcraft 50 Twin Bonanza	1	
Champion Traveller	3	
Flying clubs		283
Aeronca	48	
Cessna	91	
Stinson	17	
Taylorcraft	7	
Piper	79	
Miles Magister	3	
Ercoupe 415	6	

General aviation--Con.	
Flying clubs--Con.	
Mooney Mark 20	5
Beechcraft 35 Bonanza	4
Champion Traveller	19
CNNA* HL-1 (Brazil)	1
Luscombe Silvaire 8	1
Waco	1
Fleet Finch II	1
Private	132
Champion Traveller	2
Cessna	49
Beechcraft	24
Ercoupe	4
Piper	14
Culver Cadet	2
Miles Magister	1
Vultee BT-13	1
Messerschmidt	1
Auster Autocar	1
Klemm (Germany)	1
Aero Commander	2
Mooney	8
Stinson	10
Percival (England)	1
Boeing/Stearman	1
Bellanca B-14	2
Luscombe	2
Republic RC-3 Seebee	1
Swift	2
Ryan Navion	1
Nochaco A (Chile)	1
Porterfield	1

*Companhia Nacional de Navegacao Aerea.

Colombia

Colombia has an area of approximately 440,000 square miles, almost three times that of California, and a population of more than 14.8 million. The land slopes northward to the Caribbean Sea and westward to the Pacific. The west is dominated by three branches of the northernmost ranges of the Andes Mountains. To the east are sparsely inhabited plains and jungles comprising almost two-thirds of the country's total area. Almost all of the population and economic activities are concentrated in the western mountain region. The chief economic activities are coffee production, petroleum exploration and development, and manufacturing. Industrial development has been sparked by foreign investment, particularly from the United States.

ROLE OF AIR TRANSPORTATION

The inaccessibility by surface transportation facilities of many areas and the seasonal limitations of river transport have contributed to the popularity of air services. Although the cost of air transportation is high, it is offset in large measure by the expense of delay, damage, and pilferage that other means of transportation incur. Air links with other countries have been increasing steadily as more international routes have been added by domestic carriers and as additional foreign carriers have provided services.

Surface transportation has recently improved. Trucking provides an expensive but comparatively efficient means of transportation, the railways interconnect at several points and provide a domestic network, and the inland waterways continue as the traditional means of surface communication. The bulk of foreign trade moves by water; traffic over land frontiers is limited, and the volume by air is also slight.

The Government supports the aviation industry. Civil aviation is controlled and regulated by the Administrative Department of Civil Aeronautics *(Departmento Administrativo de Aeronautica Civil*--DAAC) and the Colombian Airports Corporation (*Empresa Colombiana de Aerodromos),* which operate independently. The Corporation owns more than 50 of the Nation's airports and controls several privately owned fields. The Government does not operate any air transport enterprises, but the air force carries mail and official shipments to remote areas of the country. The National Council of Civil Aeronautics *(Consejo Nacional de Aeronautica Civil*--CNAC), formed in July 1960, studies and determines general aviation policies in accordance with the national interest. In 1962 it expected to establish a Colombian Air Corporation *(Corporacion Aerea Colombiana)* to be composed of the national airlines now flying international routes. This organization would then be the only Colombian international airline. However, on January 13, 1962, public announcement was made that the proposal had failed.

Air agreements exist between Colombia and Great Britain, Spain, Portugal, France, the United States, and Brazil. Colombia is also a member of the International Civil Aviation Organization (ICAO).

AIRCRAFT IN USE

More than 500 civil aircraft were registered in Colombia in fiscal year 1960, and all but 42 were U. S. made. Commercial scheduled operations accounted for 87 of the total, nonscheduled and air taxi services 81, business flying 22, private flying 80, Government nonmilitary 23, agriculture 31, flying clubs 6, and miscellaneous aerial services 180. The principal U. S. makes included Douglas (64), Cessna (109), and Piper (167).

COMMERCIAL AIRLINES

Service

Colombia was the first South American country to offer commercial air transportation. The scheduled commercial airlines now provide domestic service to 100 major population and industrial centers, particularly in the central, west, and northern portions of the country. International services are offered to the neighboring South and Central American countries, the Caribbean and Atlantic islands, the United States, and several European countries.

The major international and domestic air carrier, *Aerovias Nacionales de Colombia, S.A.* (AVIANCA), was organized in October 1939. The Colombian Government owns 1.9 percent, Pan American World Airways, Inc., 38 percent, private Colombian interests 55 percent, and other foreign stockholders 5 percent. It provides domestic scheduled flights mainly to the western and central regions. Its active fleet totals almost 70 aircraft, including 1 short-to-medium-range jet; most of the rest are Douglas DC-4's, DC-3/C-47's, and DeHavilland Beavers. *Sociedad Aeronautica de Medellin, S.A.* (SAM), primarily a scheduled cargo carrier, is owned mainly by Colombian interests, but a U. S. citizen is a principal minority stockholder. SAM occasionally makes passenger flights on domestic routes, and internationally to Miami, using Curtiss C-46's, Douglas C-47's, and DC-4's. *Rutas Aereas de Colombia, Ltda.* (RAS) offers international flights to New Orleans and Miami through Panama and domestic flights to major cities, using DC-6B's, a DC-3, and a DC-4. Royal Dutch Airlines (KLM) owns 26 percent of the company and SAM the rest. *Lloyd Aereo Colombiana, S.A.* (LLACSA) has been operating a scheduled service to Miami, a domestic service between 5 cities, and a semischeduled service to Havana. The ownership and status of this airline, which has had many financial difficulties, is not certain. Two of its 3 Curtiss C-46's were lost in 1960 crashes.

Compania Aerea el Burrito, S.A. operates Curtiss C-46's on domestic freight services and to Miami, and also charters flights to other Latin American countries. Colombian interests own 51 percent, and U. S. interests own the rest. *Lineas Aereas la Urraca* (La Urraca) operates a semischeduled service in the central region south of Bogota, using a B-18 (an old-model DC-3) and a small Luscombe.

Aircraft are not domestically manufactured or assembled, although the Government authorized the assembly of crop spraying planes in September 1961. AVIANCA maintains routine service facilities in Bogota and an overhaul shop in Barranquilla. Several other domestic airlines have service and maintenance facilities, which are usually available to other firms and individuals. Light plane service is offered at several small airports.

About 45 airports are used in domestic services, including private flying, and about 10 fields are used as international airports. Airport facilities are being expanded and improved throughout the country and additional projects are being planned. Because of its central geographic location, Colombia's participation in air transportation between South America, North America, and Europe will become increasingly important. The projected airport construction and improvement will help to attract international traffic. About 16 foreign flag airlines now provide scheduled international service through Bogota.

Disposal and Reequipment Programs

Few aircraft disposals are expected. Some sales may be made between the domestic airlines. RAS, for instance, is negotiating to sell a DC-4 to SAM; it also recently exchanged 2 DC-4's to a U. S. firm for 1 DC-6B.

In November 1961, AVIANCA received the first of 2 Boeing 720's and tentatively plans to add 3 Douglas DC-4's, 1 long-range jet, and 3 turboprops or short-to-medium-range jets to its fleet by 1963. The purchase of new aircraft by other commercial operators is unlikely. However, in 1959 RAS announced that it would acquire 2 Fokker Friendships through KLM by 1963, SAM anticipated a need for 8 Curtiss C-46's or Douglas C-47's, and La Urraca planned to add a Curtiss C-46. SAM purchased 3 DC-4's in mid-1960 to replace aircraft lost in 1959 and 1960 crashes. The acquisition of this equipment depends mostly on improved rate structures and better route allocations.

GENERAL AVIATION

More than 400 general aviation aircraft were registered in Colombia in fiscal year 1960, and all but 28 were U. S. made. The 20 operating nonscheduled airlines have a total fleet of more than 80 aircraft. About 5 carry cargo; most of the rest offer passenger and air taxi services. One firm, *Aerotaxi, S.A.*, is owned by AVIANCA and operates 19 aircraft, mostly in air ambulance, agricultural, advertising, photography, and patrolling services. It also provides scheduled feeder services from outlying points to some of AVIANCA'S principal domestic stops and maintains a few routes paralleling AVIANCA's.

Helicopteros Nacionales de Colombia, Ltda. (HELICOL), a charter helicopter service operated as a subsidiary of AVIANCA, provides passenger and cargo transportation for petroleum exploration. *Taxi Aereo de Santander* (TAXADER), a privately owned airline, uses 12 aircraft on a widespread domestic service. It has been negotiating for international routes to Miami and New York and also plans to establish short international air routes to areas not now serviced by the large trunk carriers.

About 12 business firms own aircraft which they use primarily to transport company personnel and cargo. Most of the planes en-

gaged in these activities are DC-3-type twin-engine transports. Various agricultural firms and associations own single-engine aircraft and, reportedly, one of the railroads owns helicopters and conventional single-engine equipment. An unknown number of privately owned aircraft are used for business purposes.

Many privately owned aircraft pooled with aircraft owned by the clubs are used for instruction, charter taxi, or other business purposes. Several planes owned by a pipeline firm are used for patrol and maintenance purposes. Seven firms, operating a total of 31 planes, are engaged in crop dusting; a number of aircraft registered as privately owned are also used occasionally for this purpose. Most of the aircraft used for aerial surveying and mapping are registered in other countries. The *Escuela Nacional de Aviacion Civil Colombiana*--ENACC (National Aviation School), an official Government organization, uses 18 small planes for instructional purposes, and one private school has 7. Many of the private and flying club planes are used for instruction. Other Government agencies operate 5 aircraft.

MARKET POTENTIAL

Air transportation has developed extensively because of the special topographical characteristics of the country and the relatively recent industrial development. The expected improvement of the economy and the continued industrial development should create an increasing demand for aircraft.

The United States will probably continue to be Colombia's preferred source for aircraft and aeronautical products. Great Britain and France may offer competition on future orders for turbine-powered aircraft, but AVIANCA's purchase of Boeing 720 jets should help to maintain the U. S. position. Easy sales terms, ready availability of dollar exchange, and requirements of the commercial operators will determine the market for surplus piston aircraft. The state of the economy and dollar availability will be major factors in the sale of light planes.

In January 1961, TAXADER was considering the purchase of 3 DC-6B's for a Miami/New York route, or smaller aircraft to expand domestic services.

In 1959 TAXADER estimated that by 1963 it would need 3 Douglas DC-4's. Several other companies' needs by 1963 were estimated at 96 Piper PA-18's (A's and 150's) and 3 Champion 7-EC's.

An import duty of 50 percent ad valorem is imposed on touring aircraft having a capacity of 4 passengers or less, but the duty is not imposed on such aircraft imported for instruction, fumigation, aerial photography, and public transportation. All other civil aircraft and helicopters may also be imported free. Import licenses for all aircraft must be approved by the National Council of Civil Aeronautics. A previous deposit of 20 percent of the import value must also have been placed with the Exchange Registry Office, Bank of the Republic.

Commercial airlines, total..... 87

Aerovias Nacionales de Colombia, S.A. (AVIANCA)
- Boeing 720B..... 1
- Lockheed Constellation 749..... 3
- Douglas DC-4..... 11
- Douglas C-54..... 2
- Douglas DC-3..... 20
- Douglas C-47..... 11
- De Havilland (Canada) Beaver..... 14
- Cessna..... 4
- Lockheed Super Constellation 1049..... 3

Lloyd Aereo Colombiano, S.A. (LLACSA)
- Curtiss C-46..... 1

Rutas Aereas de Colombia, Ltda. (RAS)
- Douglas DC-3..... 1
- Douglas DC-4..... 1
- Douglas DC-6B..... 2

Sociedad Aeronautica Medellin, S.A. (SAM)
- Curtiss C-46..... 4
- Douglas C-47..... 2
- Douglas DC-4..... 3

Compania Aerea el Burrito, S.A.
- Curtiss C-46..... 2

Lineas Aereas la Urraca (La Urraca)
- Luscombe 11-A..... 1
- Douglas B-18..... 1

General aviation, total..... 423

Nonscheduled and air taxi..... 81

Aerotaxi, S.A.
- Cessna 195..... 4
- De Havilland (Canada) Beaver..... 15

Aerovias Condor de Colombia, Ltda. (Aerocondor)
- Curtiss C-46..... 2

Aerovias Helices, Ltda.
- Fairchild Packet C-82..... 2

Aerovias Hoffman
- Consolidated PBY-6A..... 2

Aerovias del Llano (Aerollano)
- Budd C-93 Conestoga..... 1

Aerovias Pilotos Asociados (AVISPA)
- Cessna 180..... 5

Aerovias Santandereanos Pilotos Asociados (ASPA)
- Cessna 180..... 4

Asociacion Interamericana de Aviacion (AIDA)
- Fairchild Packet C-82..... 1
- Consolidated PBY-5A..... 1

General aviation--Con.
Nonscheduled and air taxi--Con.
Lineas Aereas del Caribe, Ltda. (LIDCA)
Fairchild Packet C-82..... 1

Lineas Aereas Orientales (LAO)
Piper PA-20..... 2

Sociedad Occidental de Transportes Aereos (SOTA)
Cessna..... 1
Noorduyn Norseman..... 2

Taxi Aereo del Caqueta (TACATA)
Stinson 108..... 3
Cessna 170B..... 1

Taxi Aereo Colombiano (TACO)
Noorduyn Norseman UC-64-A..... 2
Douglas B-18..... 1

Taxi Aereo Sabanero (TASS)
Cessna 170B..... 2

Taxi Aereo de Santander (TAXADER)
De Havilland (Canada) Beaver..... 2
Stinson 108..... 1
De Havilland Otter..... 4
Cessna 180..... 2
Douglas DC-3..... 3

Taxi Aereo el Llanero
Cessna 170 A..... 4

Lineas Aereas Colombianas Expresas (LACE)
Fairchild Packet C-82..... 2

Lineas Interamericanas Aereas (LIA)
Curtiss C-46..... 3

Helicopteros Nacionales de Colombia (HELICOL)
Bell 47 (helicopter)..... 8

Agriculture..... 31

Colombiana Agricola y Trabajos Aereos (CAYTA)
Piper PA-18..... 7

Empresa de Fumigacion Aerea (EFA)
Piper PA-18..... 2

Fumigacion Aerea Colombian (FARCA)
Piper PA-18..... 6

Fumigacion Aerea y Materiales Agricolas (FAMA)
Piper PA-18..... 2

Servicio de Fumigacion Aerea (SEFA)
Stearman..... 1
Piper PA-18..... 4

General aviation--Con.
Agriculture--Con.
Microfumor, Fumigaciones Aereas, Ltda.
Piper PA-18A..... 6

Operaciones Agricolas Aereas (OPA)
Piper PA-18..... 3

Business..... 22

Aeromercantil Leaver
Piper PA-18A..... 3
Piper PA-23..... 2

Andian National Corp.
Cessna 180..... 1

Borrero & Caldas, Ltda.
Cessna 180..... 1

Congregacion de Misioneros
Cessna 170..... 1

Colombian Petroleum Co.
Douglas C-47..... 1
Douglas DC-3..... 1

International Petroleum Co.
Douglas DC-3..... 1
Douglas B-23..... 1

Mercantil Colombiana, Ltda.
Ryan Navion A..... 1
Fairchild Packet C-82..... 1

Pato Mines
Aero Commander 520..... 1

Servicio Aereo de Exploracion Forrestal
Noorduyn Norseman UC-64-A..... 1

Socovias, Ltda.
Piper PA-22-150..... 1

Madigan Hyland South American Corp.
Piper..... 3

Texas Petroleum Co.
Douglas C-47..... 1
Consolidated PBY-5A..... 1

Government, nonmilitary..... 23

Ministerio de Higiene
Cessna 180..... 2
De Havilland (Canada) Beaver..... 1

National Aviation School..... 18

General aviation--Con.
Government, nonmilitary--Con.

Ministerio de Haciendas		
Cessna 170B	1	
Ministerio de Obras Publicas		
Beechcraft 18-S	1	
Flying clubs		6
Aeroclub de Colombia		
Piper PA-18A-135	1	
Aeroclub Albatros		
Cessna 140A	1	
Piper PA-18-95	1	
Aeroclub Girardot		
Piper PA-18	2	
Aeroclub Manizales		
Piper PA-18-135	1	
Private		80
Piper PA-18A	12	
Piper PA-23	4	
Cessna 180	4	
Ryan Navion	5	
Luscombe	6	
Cessna 172	4	
Cessna 170B	6	
Piper PA-11	1	
Mooney M-18-LA	2	
Taylorcraft	3	
Piper PA-22	11	
Ercoupe 415C	3	
Cessna 182	5	
Cessna 140	1	
Douglas C-47	2	
Piper PA-12	1	
Stinson	3	
Piper PA-14	1	
Fairchild Packet C-82	1	
Aero Commander 520	1	
Beechcraft B-35	1	
Rawdon T-L-T	1	
Curtiss C-46	1	
Noorduyn Norseman UC-64-A	1	
Miscellaneous agriculture, air taxi, and flying club aircraft		180
Piper PA-18	72	
Bell 47 (helicopter)	26	

General aviation--Con.
Miscellaneous agriculture, air taxi, and flying club aircraft--Con.

Cessna 180	29
Cessna 170	15
Piper PA-22	13
Hiller UH-12 (helicopter)	4
Cessna 310	1
Beech 50	1
Bellanca 140M	3
Cessna 182	6
Cessna 195	4
Piper Apache PA-23	6

Ecuador

Ecuador is bounded by Colombia on the north, Peru on the east and south, and the Pacific Ocean on the west. It consists of four distinct geographical regions: Two parallel ranges of the Andes Mountains, having many peaks towering more than 16,000 feet, cross the country from north to south, and between these ranges are high plateaus divided by numerous transverse ridges; to the west and stretching along the Pacific coast are low hills and swampy lowlands; east of the Andes the land gradually slopes away to the low Amazon Valley of the Peruvian border; the Galapagos Islands, located 600 miles off the coast, cover an area of 3,000 square miles.

The country has an area of approximately 105,000 square miles, about the size of Colorado. It is the second smallest of the South American Republics. The population of about 4 million is concentrated largely in the mountain area. In recent years, however, increasing numbers of people have been moving to the coastal region. Agriculture and animal husbandry are the basic economic activities, providing employment for almost 50 percent of the 1.2 million economically active population and producing close to one-third of the national income. The climate is tropical in the Pacific lowlands and desert in the extreme south. Guayaquil is the largest city and the center of population; Quito is the capital.

ROLE OF AIR TRANSPORTATION

Commercial aviation initially developed in the populous mountain region, and then in the coastal region. Air operations in the area east of the Andes are chiefly nonscheduled or air taxi services. The trip of about 270 miles between Quito and Guayaquil

illustrates the importance of air transportation. It requires 9-11 hours by car and 12 hours by train, but less than 1 hour by plane. Air service is especially important as a means of improving economically the otherwise inaccessible and underdeveloped areas. The railway and highway transportation facilities are inadequate.

Civil aviation is administered by the Directorate General of Civil Aviation (DGAC) in the Ministry of Public Works and Communications. In recent years the Government has been taking an increased interest in the administration and development of civil aviation. All commercial airports are Government owned, and several airfields are being improved. The Government has no financial interest in any air carrier and does not subsidize any private aviation enterprise. However, some exemption from landing fees is available from the Government to encourage the formation and development of national air carriers.

AIRCRAFT IN USE

About 100 civil aircraft are registered, 30 of which are used by 7 commercial airlines and the balance for general aviation purposes. The total air fleet includes 3 Douglas C-47's, 1 DC-4, 1 DC-6, and 2 Curtiss C-46's. The rest are small 2-10 place types, including 11 helicopters. All the aircraft except a Junkers JU-52 are U. S. made.

COMMERCIAL AIRLINES

Service

Commercial air transportation is served mostly by small passenger and cargo airlines, usually using 2-10 place aircraft. Larger aircraft are not used in many areas because of the limited volume of traffic and because the rough terrain makes construction of adequate airfields difficult and expensive.

The larger airlines have regularly scheduled domestic flights between the most important cities and some international flights. *Aerovias Ecuatorianas, C.A.* (AREA), offers scheduled flights from Quito to about 8 domestic points, using 3 C-47/DC-3's and a DC-4. *Ecuatoriana de Aviacion* provides a scheduled DC-6 international service connecting Guayaquil and Quito with Peru, Colombia, Panama, and the United States. *Linea Internacional Aerea* (LIA) operates a scheduled service between Quito and Guayaquil, using C-46's and a Boeing Stratocruiser. Both scheduled and nonscheduled flights from Guayaquil to cities in the western provinces are conducted by *Compania Ecuatoriana de Transportes Aereos* (CEDTA), using 9 light aircraft; *Servicios Aereos Nacionales* (SAN), using 8 light aircraft; and *Vias Aereas Nacionales, S.A.* (VIANSA), using 3 light aircraft. Similar service between Quito and Guayaquil, Quito and 6 cities of the northwestern provinces, and Quito and various towns in the eastern provinces is

conducted by *Transportes Aereos Orientales* (TAO), using 2 light aircraft and a C-47B.

Approximately 50 airfields are located in Ecuador and 1 in the Galapagos Islands. Only the fields at Guayaquil and Quito can accommodate the heavy jet aircraft used in international operations. The only aircraft overhaul and maintenance facilities are the small ones owned by the airlines. No flight or ground training schools exist, but a Link trainer course is offered by the Government and the Guayaquil Aero Club provides some flying instruction in light aircraft.

Ecuador is a member of the International Civil Aviation Organization (ICAO) and has signed all of the major international civil aviation conventions. It has air agreements or arrangements with 10 other nations. The foreign flag carriers operating in the country are Pan American-Grace Airways, Inc. (PANAGRA) and Braniff International Airways, offering DC-7 service; *Aerovias Nacionales de Colombia, S.A.* (AVIANCA), Super Constellation service; Royal Dutch Airlines (KLM), Super Constellation service; *Aerolineas Peruanas, S.A.* (APSA), DC-6 service; and Air France, Boeing 707 service. All these airlines fly into Guayaquil, connecting with the United States and other parts of the world. PANAGRA and AVIANCA also operate into Quito.

Disposal and Reequipment Programs

In 1959, Equatoriana planned to purchase by 1962 a second DC-6 and perhaps another 4-motor piston-engine aircraft. It also hopes to acquire a third DC-6 before 1964 if economic conditions are favorable. LIA recently replaced a C-46F aircraft with a Boeing Stratocruiser. In 1959 it planned to acquire by 1964 several DC-6's for international flights, and by 1962 several 8-12 passenger aircraft of the Lodestar type for air taxi operations in the highland area. The DC-6 acquisition was to be rented; purchase depended on the outcome of negotiations for flight permits into foreign countries. If these negotiations were successful, the company would be in the market after 1964 for the exchange of some of the DC-6's for turboprop or jet equipment. LIA feels that despite strong competition from the large international air carriers, an expanding market still exists for its low-fare and less luxurious services.

AREA lost a Fairchild F-27 in a November 1960 crash and then acquired a DC-4. When the F-27 which crashed was acquired in late 1959, AREA reportedly was considering the purchase of another, and possibly several C-47's by 1964. TAO purchased a C-47B in 1960 and disposed of a Noorduyn Norseman UC-64-A.

U. S. equipment is preferred because of ease of maintenance and availability of spare parts.

GENERAL AVIATION

Almost no business or pleasure flying is done. Two individuals in Guayaquil own 3 private planes, and the Guayaquil Aero Club, the only flying club, also has 3 aircraft used mainly for instruction. Crop dusting is the fastest growing part of civil aviation. The success of the banana crop, the country's leading export, depends mostly on adequate fungus control by airplane or helicopter spraying. Twelve companies are now engaged in this activity, as compared with only two in 1957. They operate a total of 54 aircraft, including 10 helicopters. Air taxi services are provided by 2 firms--ATESA and ECUAVIA--operating a total of 10 utility aircraft, including 1 light twin-engine plane and 1 helicopter.

MARKET POTENTIAL

Continued economic growth is expected. The National Planning and Economic Coordination Board represents the central Government in promoting economic development. The United States International Cooperation Administration, now the Agency for International Development, and the United Nations have provided technical assistance, and the International Bank for Reconstruction and Development has provided financial aid for special programs. The rate of air transportation development depends mostly on improved airport and airway facilities. The recent improvements at the Quito and Guayaquil airports promise an increase in domestic and international traffic in the next few years. The nearest FAA-approved repair base is in Costa Rica. Establishment of adequate maintenance repair facilities would advance civil aviation in Ecuador and in neighboring countries.

The market potential for commercial transport aircraft by 1964 is good; about 10 piston-engine planes, ranging from Lodestar to DC-6 types, will probably be in demand. Crop dusting now offers the best market for utility aircraft sales. Business and pleasure flying may expand considerably, however, because many large haciendas are located in areas poorly served by other means of transportation.

United States banks generally require guaranty by an Ecuadorean bank of payments for airplane purchases made by Ecuadorean corporations. Reportedly this requirement limits potential sales. Low-cost insurance of payments through U. S. insurance companies has been suggested as a better and cheaper means of guaranty. The availability of foreign exchange still depends on the strength of the domestic economy and the continued expansion of export markets. No import restrictions are imposed on aircraft, spare parts, or other aeronautical equipment. Only an import permit approved by the Director General of Civil Aviation is required.

Commercial airlines, total..... 32

Aerovias Ecuatorianas, C.A. (AREA)
- Douglas C-47/DC-3..... 3
- Douglas DC-4..... 1
- Cessna 310..... 1

Compania Ecuatoriana de Transportes Aereos (CEDTA)
- Beechcraft C-45..... 2
- Stinson V-77..... 1
- Piper PA-22-150..... 6

Ecuatoriana de Aviacion
- Douglas DC-6..... 1

Linea Internacional Aerea (LIA)
- Curtiss C-46A..... 2
- Boeing Stratocruiser..... 1

Servicios Aereos Nacionales (SAN)
- Cessna 170..... 4
- Cessna 180..... 1
- Cessna 182C..... 1
- Beechcraft C-45..... 2

Transportes Aereos Orientales (TAO)
- Junkers JU-52..... 1
- Douglas C-47B..... 1
- Cessna 180C..... 1

Vias Aereas Nacionales, S.A. (VIANSA)
- Cessna 180..... 3

General aviation, total..... 70

Air taxi..... 10

ATESA
- Cessna 182C..... 2

Compania Ecuatoriana de Aviacion, C.A. (ECUAVIA)
- Piper PA-18-150..... 2
- Piper PA-18A-150..... 2
- Piper PA-23..... 1
- Cessna 172..... 1
- Bell 47G-1 (helicopter)..... 1
- Piper Super Cub..... 1

Agriculture..... 54

Atomec
- Piper PA-18A-150..... 6
- Piper PA-18-150..... 4

Aero Fumigadora
- Piper PA-18A-150..... 4
- Piper Apache PA-23..... 1

General aviation--Con.
Agriculture--Con.
Aero Fumigadora--Con.
Cessna 170A..... 1
Cessna 170B..... 1

Fasa
Piper PA-25..... 2
Stearman A-75..... 2

Exportadora Bananera, S.A.
Hiller UH-12C (helicopter)..... 4
Hiller UH-12E (helicopter)..... 1
Ryan Navion-B..... 1

Sociedad Agricola Industrial
Hiller UH-12B (helicopter)..... 1
Hiller UH-12C (helicopter)..... 1

Cadasa
Piper PA-18A-150..... 12
Piper PA-18-150..... 4
Piper Super Cub..... 3

Agro Aereo
Hiller UH-12E (helicopter)..... 1

Furtera Sudamericana
Hiller UH-12C (helicopter)..... 1

Ubesa
Piper PA-18-150..... 1

Aerolineas Bananera Agricola
Piper Apache PA-23-160..... 1

Standard Fruit
Bell 47G-1 (helicopter)..... 1

Falasa
Piper PA-18A-150..... 1

Private..... 3

Piper PA-J3C-65..... 1
Bellanca 14-13-2..... 1
Cessna 182C..... 1

Flying club..... 3

Guayaquil Aero Club
Piper PA-18..... 2
Cessna 140..... 1

Paraguay

Paraguay is landlocked. It has a total area of more than 157,000 square miles, is about the size of California, and has a population of approximately 1.7 million. The west, consisting mainly of low, undulating plains having a maximum elevation of 750 feet, is drained by sluggish, unnavigable rivers and contains vast stretches of grass and woodlands. Eastern Paraguay is rolling and heavily wooded, having swamplands, vast plains, and low plateaus with maximum elevations of about 2,000 feet. Approximately 95 percent of the population is located in this area. Two-thirds of eastern Paraguay is in the Temperate Zone, but the climate is subtropical. Most of the rest of the country is in the Torrid Zone and has a tropical climate. Rainfall averages about 80 inches annually along the eastern border.

Paraguay is one of the least developed countries in the Western Hemisphere. Its economy is based on agriculture, livestock, and forestry. Industrial activity is limited to processing semifinished manufactures for export. Asuncion, the capital, is the financial and commercial center of the country. Through its port on the Paraguay River passes almost all of the country's international trade.

ROLE OF AIR TRANSPORTATION

Civil aviation was started in 1929 by an Argentine company which provided service between Asuncion and Buenos Aires. Air transportation is important because of the lack or inadequacy of surface transportation facilities. Commercial airlines connect the most important domestic points, some of which are practically inaccessible by surface transportation. Air taxi services, developed in 1940, link most of the other population centers of the country. The scheduled airlines are Government owned and operated. The importance of international air transportation is highlighted by the fact that traveling from Asuncion to Buenos Aires takes 56 hours by train or several days by ship over the Paraguay-Parana Rivers system, but flying time is only 4 hours.

The official Government agency regulating civil aviation is the *Direccion General de Aeronautica Civil*, established in October 1950. The *Administracion Nacional de Aeropuertos Civiles* (ANAC), established in January 1952, develops and regulates domestic civil airports. Both organizations operate under the jurisdiction of the Ministry of National Defense. Technical assistance is provided by the International Civil Aviation Organization (ICAO) and a Civil Aviation Assistance Group of the U. S. Operations Mission in Paraguay.

AIRCRAFT IN USE

The Paraguayan civil air fleet has almost 70 aircraft, of which all but 8 are U. S. made. The 7 commercial airlines own and op-

erate more than 20 planes, 6 of which are under military registration although used for civil operations. More than half of these planes are multiengine; most of the rest are 2-5 passenger, single-engine utility types. The almost 50 aircraft in general aviation are used for business and instruction. Except for 2 twin-engine utility planes and a C-46, all these aircraft are small single-engine models.

COMMERCIAL AIRLINES

Service

Two national flag carriers, *Linea Aerea de Transporte Nacional* (LATN) and *Transporte Aereo Militar* (TAM), offer scheduled domestic services. TAM, established in May 1955, is part of the Paraguayan Air Force, but it operates as a passenger and cargo airline on a commercial basis to points otherwise without transportation facilities. It was established to promote civil aviation, to train pilots, and to aid in the economic development of the country. It uses 5 DC-3's for scheduled domestic passenger service to about 12 points and for domestic and international cargo and charter flights. LATN was established by the Government in 1944 and has been a wholly Government corporation since 1954. It has a monopoly on air taxi services and uses light utility aircraft for ambulance, charter, and regularly scheduled passenger flights throughout the country. A Catalina flying boat owned by this firm is under military registration. LATN's regular routes into areas in which TAM's larger aircraft cannot operate are served with small planes. Both lines share the air charter service, according to the landing capabilities of their planes. LATN's cargo services are limited.

Five nonscheduled carriers offer domestic and international services. *Alas Guaranies* and *Aero-Carga* provide cargo flights between Asuncion and the major population centers and transport essential foodstuffs and meat into Paraguay from neighboring countries, using 1 aircraft each. The other 3 commercial airlines offer mostly international cargo flights, using a total of 3 aircraft including a C-46. The foreign flag air carriers serving Paraguay are *Aerolineas Argentinas*, *Nacional* (Brazil), Braniff International Airways, Panair do Brasil, *Primeras Lineas Uruguayas de Navigacion Aerea*, *Lloyd Aereo Boliviano* (LAB), and Pan American World Airways.

About 12 airports in Paraguay can accommodate aircraft the size of a DC-3; several hundred landing strips accommodate small private and air taxi planes. Besides Asuncion, which has the only hard-surface runway in the nation, Concepcion and Encarnacion also have foreign flag connections—with Argentina and Brazil, respectively. International carriers from other countries operate through Asuncion National Airport, the facilities of which are being improved with assistance from the Export-Import Bank. No air-

craft manufacturing or assembly firms exist in Paraguay. Major overhaul work is assigned to Brazilian repair facilities. Minor repairs for TAM and LATN planes are undertaken by the Government.

Paraguay has signed bilateral air agreements with the United States, Brazil, Uruguay, Chile, and the Netherlands. Flights from other countries are covered by Paraguayan permits.

Disposal and Reequipment Programs

TAM does not plan to dispose of any of its fleet. It will probably be in the market for several DC-3's, DC-4's, and Convair 340's or 440's. In 1959 LATN planned to replace all its aircraft with twin-engine Cessnas. Since then, however, the total fleet has increased rather than decreased, and no reports are available about the Cessnas, which were to have been purchased by 1961. *Alas Guaranies'* PB4Y-2 Privateer will probably be replaced in the near future.

GENERAL AVIATION

There is no pleasure flying in Paraguay, the majority of the aircraft not used for airline operations being used for business flying. A United States firm engaged in quebracho manufacture, meat production, and oil exploration uses a C-46 and a Cessna for passenger and cargo transportation. Other business firms use their aircraft similarly. Several Government ministries have executive planes. The aero clubs' planes are used exclusively for instructional flying. The rest of the private planes are used by ranchers. Air taxi service is considerable. It is a Government monopoly operated by LATN. Aerial patrol or survey work and crop dusting have not yet developed.

MARKET POTENTIAL

The market potential for civil transport aircraft is limited by the country's poor financial position and the small volume of traffic. Reportedly, however, there may be a market for 2-4 DC-3's, 1 C-46 and DC-4, or 2-3 Convairs. U. S. equipment is preferred by all of the aviation organizations because operational personnel are familiar with it. Because the Government has not been able to deal on cash terms, aircraft purchases depend on adequate financing arrangements. Financing might possibly be arranged through the Central Bank of Paraguay, through lease purchase arrangements or through the sale of existing equipment. The acquisition of aircraft by the domestic commercial airlines is limited because the Government maintains a near monopoly on domestic scheduled passenger airline operations through TAM. This limits other commercial operations to international passenger services, thus restricting the expansion of commercial civil aviation because not enough traffic now originates in Paraguay to support a wholly international operation.

The Government supports civil aviation by exempting all planes and equipment for private use from import duties, consular fees, stamp tax, and sales tax. Through the air force, the Government provides gasoline and small repairs free of charge to the flying club planes.

The planned improvement of surface transportation will eventually decrease the need for private business flying. But as the economy improves, international traffic should be stimulated by businessmen and tourists. Cargo operations have not been significant, but as commerce and industry improve, demand should develop. Maintenance facilities also should develop. As aviation expands, the need for servicing facilities will grow. Most of the planes acquired by the domestic commercial operators have been reconditioned ones. The low initial cost of such planes has been suitable for the inexpensive cargo and air taxi services provided. These aircraft require continual repair and overhaul and spare parts.

A deposit of 200 percent of the f.o.b. value is required on imports of airplanes and parts and an exchange surcharge of 24 percent is levied on the c.i.f. value when equipment is shipped from noncontiguous countries. The Central Bank collects the surcharge at the time of sale of foreign exchange.

Paraguayan Civil Air Fleet—66

Commercial airlines, total	22
Lineas Aerea de Transporte Nacional	
Beechcraft Twin	3
Beechcraft Bonanza	6
Noorduyn Norseman	1
Stinson	1
Convair Catalina PBY	1
Transporte Aereo Militar (TAM)	
Douglas DC-3	5
Lloyd-Aereo Paraguayo	
Curtiss C-46	1
Alas Guaranies, S.A.	
Convair Privateer PB4Y-2	1
Aero-Carga, S.A.	
De Havilland	1
Intercontinental, S.A.	
Beechcraft, Twin	1
Cia Aviacion Paraguaya, S.A.	
Cessna 182-A	1

General aviation, total..... 44

Business..... 12

International Products Corp.
Curtiss C-46..... 1
Cessna 175..... 1

CIPA, S.A.
Ryan Navion..... 1

Pure Oil Co.
Cessna 180A..... 1

Manufactura de Pilar, S.A.
Piper Apache PA-23..... 1

SACRIFIC
Ercoupe..... 1

Corporacion Paraguaya de Carnes
Cessna 182..... 1

La Inmobiliaria, S.A.
Cessna 180..... 1

Carlos Casado Ltda., S.A.
Cessna 180..... 1

COINPA, S.A.
Cessna 170..... 1

Domingo Fassardi Ltda., S.A.
Beechcraft 35 Bonanza..... 1

Liebig's Extract of Meat Co., Ltd.
Cessna 182B..... 1

Private..... 20

Aeronca..... 1
Cessna 190..... 1
Cessna 170A..... 2
Cessna 172..... 2
Cessna 182..... 6
Cessna 182C..... 1
Saab Safir..... 1
Cessna 172A..... 1
Ercoupe..... 1
Cessna 175..... 1
Auster..... 1
Stinson Voyager..... 1
Piper..... 1

Government, nonmilitary..... 5

Ministerio de Salud Publica y Prevision Social
Beechcraft 50 Bonanza..... 1

General aviation--Con.	
Government, nonmilitary--Con.	
Ministerio de Defensa Nacional	
Cessna 180	1
Piper	1
Ministerio de Obras Publicas y Comunicaciones	
Cessna 180	1
Piper	1
Flying clubs	7
Club de Planeadores	
Beechcraft Twin	1
Aero Club del Paraguay	
Neiva Paulistinha	3
Stinson	2
Niess	1

Peru

Peru is the third largest country in South America; its area of more than 500,000 square miles is about twice that of Texas. It has a 1,400-mile coastline bordering the Pacific Ocean. The giant Andes Mountains parallel the coast and slope eastward to the lowlands which cover about 60 percent of the country. The population in mid-1960 was estimated at almost 11 million, of which about 56 percent lived in rural areas.

The economy is based mostly on agriculture, including animal husbandry and forestry, but mining--particularly petroleum production—and industry are becoming increasingly important. The economy should improve because of the existing high level of foreign trade and Central Bank reserves, the basic strength of the currency, the relative stability of prices, and the increased availability of foreign exchange.

ROLE OF AIR TRANSPORTATION

Peru has fairly well-developed surface transportation systems. Railroads and trucking carry a substantial part of all domestic bulk freight traffic, and the railroads also carry much of the total domestic passenger traffic. Rivers provide the only means of surface transportation in most of eastern Peru. Ocean shipping lines carry the greatest part of the foreign trade. Air service is especially important for flights over the Andes to areas which are mostly inaccessible by surface transportation. It accounts for most international passenger traffic, but for only a limited part of total international cargo. Since 1954 both domestic and international air traffic have increased steadily. Aerial surveys have

helped improve the national economy by aiding the development of mineral resources. Crop dusting and whale searching are other important air services.

The Ministry of Aeronautics *(Ministerio de Aeronautica)* through the Bureau of Civil Aeronautics *(Direccion General de Aeronautica Civil)*, which legally must be headed by a Major General of the Peruvian Air Force, controls civil aviation. Policy matters involving operating permits are sometimes referred to the Consultative Council on Civil Aeronautics *(Consejo Consultivo de Aeronautica Civil)*. The Government promotes civil aviation. It operates a carrier airline through an agency of the Bureau of Civil Aeronautics, and supports the flying clubs. It encourages the operations of domestic airlines, but it does not grant subsidies. In 1958 the Government agreed to the establishment of a Civil Aviation Assistance Group as part of the U. S. Operations Mission in Peru. The group would help plan the new Lima airport, train traffic control and airways personnel, and select and maintain new and improved equipment. Progress is reported to be slow but promising.

Peru is a member of the International Civil Aviation Organization (ICAO), whose regional office for Latin America south of Mexico is at the Lima airport. Bilateral air transport agreements are in effect with the United States, Canada, Spain, the Netherlands, Honduras, Brazil, Cuba, Chile, the United Kingdom, Panama, and Switzerland.

AIRCRAFT IN USE

More than 180 civil aircraft were registered in Peru in 1959-60, of which all but 6 were U. S. made. The commercial airlines operated almost 60 planes; the rest were used in general aviation activities. The principal U. S.-manufactured aircraft were 77 Stearmans, 23 Pipers, 18 Cessnas, 11 Douglas DC-4's, and 11 Douglas DC-3/C-47's.

COMMERCIAL AIRLINES

Service

The major scheduled airline is the privately owned *Compania de Aviacion "Faucett", S.A.*, established in 1928 and one of the oldest airlines in Latin America. It operates its own pilot school, a complete FAA certificated maintenance shop, and a fleet of 18 aircraft. Reportedly, about 22 percent of the company's outstanding stock is held by Pan American-Grace Airways, Inc. (PANAGRA). In 1960 Faucett was authorized to offer international services; its domestic routes now serve all principal cities. Regularly scheduled international passenger-cargo service is also offered by *Aerolineas Peruanas, S.A.* (APSA). Reportedly, this airline is controlled by TAN airlines of Honduras, which in turn

is controlled by U. S. capital. APSA offers services from Lima to Miami, Santiago, and Buenos Aires, using DC-6's.

The Government owns and operates *Transportes Aereos Militares* (TAM), using 14 aircraft for domestic services parelleling many of Faucett's routes, and for semischeduled flights to otherwise unserved jungle areas. The Summer Linguistics Institute *(Instituto Linguistico de Verano)* of the University of Oklahoma operates a subsidiary nonscheduled passenger-cargo service for TAM.

Until its operations were suspended in 1959, *Transportes Aereos Peruanas, S.A.* (TAPSA), provided regularly scheduled domestic passenger-cargo services. The airline may be reactivated. In addition to scheduled services, TAPSA also offered charter flights, using 4 aircraft.

Aero-Taxi, S.A. is a U. S.-Peruvian-owned nonscheduled air taxi service, operating 3 Cessnas. Its main customers are mining companies requiring executive transport services. *Expreso Aereo Peruana, S.A.* is a U. S.-Peruvian-owned company, operating a charter service. This company lost 2 Fairchild C-82's in 1959 crashes and has been operating 1 plane leased from a domestic business firm.

Foreign airlines furnishing regularly scheduled services to Peru are as follows: Pan American-Grace Airways, Inc. (PANAGRA); Braniff International Airways; Royal Dutch Airlines (KLM); Canadian Pacific Airlines (CPA); *Linea Aeropostal Venezolana* (LAV); *Aerovias Panama* (APA); *Aerovias Nacionales de Colombia* (AVIANCA); *Panair do Brasil; Linea Aerea Nacional Chilena* (LAN); *Lineas Aereas de Nicaragua* (LANICA); and Air France.

The Peruvian Airports and Commercial Aviation Corporation *(Corporacion Peruana de Aeropuertos y Aviacion Comercial--* CORPAC), a civilian organization, has as its major functions the construction, maintenance, and improvement of civil and commercial airfields; airport administration; the provision of airways services; and the training of personnel.

In April 1959, of the 37 airports being used, only 4 could accommodate planes the size of the DC-7 or larger; 3 others could handle planes the size of the DC-6, and 7 could handle planes as large as the DC-4. Twenty-two airports could take no planes larger than the DC-3, and 1 airport could accommodate only light utility planes. Five of the airports handled international flights. The new Lima-Callao International Airport was officially opened in October 1960, giving Peru one of the most modern airport installations in Latin America.

Disposal and Reequipment Programs

No plans for aircraft disposal have been reported. APSA has 2 turboprop Lockheed Electras on order. These aircraft will be operated on the airline's routes from Lima to Panama City and Buenos Aires. Reportedly, credits have been approved for the

Government's purchase of 5 French-made helicopters. Faucett recently purchased several DC-6B's for international service from Lima to Miami and New York. It plans to replace the DC-6's with turboprops or jets when traffic demand increases.

GENERAL AVIATION

More than 120 aircraft are used in general aviation activities. Six companies are engaged in crop spraying and dusting, using more than 90 planes. Business flying is limited mostly to the foreign oil and mining companies. Five firms operate about 8 aircraft, and one of them, Le Tourneau, also engages in commercial nonscheduled flying. A whaling company, *Consorcio Ballenero, S.A.*, uses 1 Piper aircraft. Two flying clubs have 9 aircraft used mainly for instructional flying. The University of Oklahoma's *Instituto Linguistico de Verano*, a nonprofit organization conducting scientific studies of the Indian languages and cultures, uses about 6 of its 16 aircraft--including a PBY, a Grumman amphibian, and several single-engine land planes--for access to isolated jungle areas. The Institute also operates a mail and equipment delivery service to army posts in the jungle. Reportedly, several Government ministries operate planes for official use. Private flyers use about 14 aircraft.

MARKET POTENTIAL

No immediate major changes are expected in the status of Peruvian civil aviation. Commercial aviation will continue to be important partly because more areas will be opened for exploration, exploitation, and development. The large domestic carriers are expected to continue adding modestly to their fleets as economic conditions improve. No switch to jet aircraft is now anticipated. Business and private flying will expand only modestly because of the limited number of public airfields in isolated areas and the lack of large-scale industrial development.

Replacements and new aircraft for domestic use must be able to make quick transitions from sea level to altitudes of 20,000 feet and to takeoff and land on short sod strips. Helicopters have not been particularly popular because their service ceiling characteristics are considered inadequate for use in the high Andes Mountains.

Peru offers a small potential market for U. S. surplus piston-engine aircraft because U. S. equipment is preferred and most of the aircraft in the existing domestic transport fleet are nearing obsolescence. Prices and terms of payments are important factors in the procurement plans of the domestic airlines. Aircraft of all types are handled by a number of distributors. No aircraft are domestically manufactured, although Faucett has assembled several Stinson models. Many aircraft buyers purchase in person in the United States. There are no import duties as such on aircraft or parts, but a surtax ranging from 9.5-13.9 percent of c.i.f. value is levied.

Commercial airlines, total..... 58

Scheduled..... 38

Compania de Aviacion "Faucett", S.A.
- Douglas DC-4..... 4
- Douglas DC-3..... 4
- Douglas C-47B..... 6
- Stinson..... 4

Transportes Aereos Militares (TAM)
- Curtiss C-46F..... 4
- Douglas C-47..... 3
- Douglas DC-3..... 4
- De Havilland (Canada) Beaver..... 3

Aerolineas Peruanas, S.A. (APSA)
- Douglas DC-6B..... 1
- Curtiss C-46B..... 1

Transportes Aereos Peruanos, S.A. (TAPSA)
- Curtiss C-46..... 4

Nonscheduled..... 20

Aero-Taxi, S.A.
- Cessna UC-78..... 3

Expreso Aereo Peruano, S.A. (EAPSA)
- Fairchild Packet C-82..... 1

Instituto Linguistico de Verano
- Aeronca..... 3
- Noorduyn Norseman..... 3
- Grumman (amphibian)..... 1
- Convair Catalina PBY..... 1
- Cessna 180..... 2
- Cessna UC-78..... 1
- Helio Courier..... 5

General aviation, total..... 124

Agriculture..... 93

Servicios Aereos Agricolas, S.A. (SAASA)
- Piper J-3..... 3
- Piper PA-18..... 5
- Howard..... 1

Alas Agricolas, S.A. (AASA)
- Stearman..... 7
- Piper PA-18..... 2
- Cessna 170..... 1

Fumigadora Alas Iquenas, S.A. (FAISA)
- Piper PA-18..... 5

General aviation--Con.
Agriculture--Con.
Compania Aerea de Servicios Agricolas, S.A. (CASASA)
Stearman..... 9
Cessna 170..... 1

Compania Aerea Fumigadora Agricola (CAFA)
Stearman..... 28

Compania Aero-Comercial, S.A. (CACSA)
Stearman..... 29
Waco..... 1
Stinson..... 1

Business..... 8

Consorcio Ballenero, S.A.
Piper Apache PA-23..... 1

Marcona Mining Co.
Douglas DC-3..... 1

Southern Peru Copper Corp.
Helio Courier..... 1
Aero Commander..... 1

Minerales y Metales, S.A.
Fairchild Packet C-82..... 1

Compania Minera Acari
Beechcraft..... 1

Le Tourneau del Peru, S.A.
Cessna 195..... 1
Piper..... 2

Flying clubs..... 9

Aero Club de Lima
Stearman..... 3
Piper J-3..... 1
Champion..... 2

Aero Club de Trujillo
Stearman..... 1
Vultee..... 1
Piper PA-18..... 1

Private..... 14

Cessna 170..... 6
Cessna 120..... 1
Cessna 172..... 1
Cessna 180..... 1
Piper Super Cub..... 2
Piper PA-22..... 1
Arrow..... 1
Champion..... 1

Uruguay

Uruguay has an area of more than 72,000 square miles, a little greater than that of Oklahoma, and a population of almost 3 million. The smallest South American country, it is one of the most densely populated and is among the top three in per capita income. One-third of the total population lives in Montevideo--the capital, chief port, and major financial and industrial center. The literacy rate, 88 percent of the population 10 years of age and over, is the highest in South America.

Most of the country is hilly, but the elevation never exceeds 2,000 feet. Uruguay is bordered on the east and south by the Atlantic Ocean and the Rio de la Plata, and on the north by Brazil. In the west, the Uruguay River separates the country from Argentina. The economy is traditionally agricultural, and livestock accounts for about four-fifths of the total value of exports. Agriculture is decreasing in importance, however; and industry has grown substantially in recent decades.

The annual value of foreign trade has declined. The chief markets once were in Europe, especially the United Kingdom, but since World War II the U. S. has been the principal buyer. Although the U. S. is now usually the chief supplier, the United Kingdom sometimes takes the lead. Colonia, located about 75 miles west of Montevideo, is an important center for shipments and transportation to Argentina.

ROLE OF AIR TRANSPORTATION

Domestic air services have not increased greatly, owing to the small size of the country and the small aircraft which must be used because of the inadequate ground facilities. The highway system, consisting of about 28,000 miles of roads, is the principal means of internal transportation. Buses carry more than 75 percent of the domestic passenger traffic, and trucks carry about 80 percent of the freight. The commercial airlines offer regularly scheduled flights to four South American countries and plan to add more services.

The Uruguayan Government controls, supervises, and promotes all civil aviation activities through the Bureau of Civil Aeronautics *(Direccion de Aeronautica Civil)*, which is under the jurisdiction of the Ministry of Defense. It owns and operates all airports and acts as contractor for airport construction. It also promotes civil aviation by exempting foreign and domestic airlines from all taxes on gasoline, spare parts, and other aviation supplies. The Government, recognizing the inadequacy of domestic and international transportation, has established a coordinating agency to promote and protect the national interest in aviation.

AIRCRAFT IN USE

The civil air fleet totals almost 430 aircraft, of which all but 23 are U.S. made. Except for 10 commercial transports and a 14-seat Douglas DC-2 in private business use, all the planes are 1-5 passenger types. The 2 operating commercial airlines use Douglas DC-3's, Vickers Viscounts, Short hydroplanes, and a Curtiss C-46 for passenger-cargo service. A Ryan Navion is maintained for instruction. The balance of the civil air fleet is used in general aviation activities.

COMMERCIAL AIRLINES

Service

The two domestic scheduled commercial airlines are the Government-owned *Primeras Lineas Uruguayas de Navegacion Aerea* (PLUNA), offering both international and domestic flights, and the privately owned *Compania Aeronautica Uruguaya, S.A.* (CAUSA), offering only international service.

PLUNA, the only airline flying to the interior of the country, has a fleet of 4 DC-3's and 3 Viscounts, operating on routes into Brazil, Bolivia, Argentina, and Paraguay, and between most of the important domestic cities. Although PLUNA is not granted monopoly privileges, its position as the major national flag carrier in domestic and international air traffic is practically uncontended. Its charter states that no Government authorization for the operation of new airlines within the country will be granted without previous consultation with PLUNA's board of directors.

CAUSA, operating since 1938, has 2 hydroplanes which are used between Montevideo and Buenos Aires and a Curtiss C-46 Super C for scheduled service between Montevideo and Colonia and Buenos Aires. This C-46 will also be used on three recently initiated international routes. About 15 foreign flag airlines offer international service, including connections with the U.S. and Europe.

All commercial airports are Government owned and operated. Carrasco National Airport is the central terminal for all international landplane traffic. Except for Carrasco, the commercial airports have unpaved runways and are unable to accommodate large aircraft. CAUSA uses hydroports at both Montevideo and Colonia. No aircraft manufacturing, assembly, maintenance, or overhaul firms exist. The airlines do their own minor maintenance work. Uruguay is a member of the International Civil Aviation Organization (ICAO), and has signed 10 bilateral air agreements.

Disposal and Reequipment Programs

The two commercial airlines operating in Uruguay have no plans to sell or convert their aircraft. In 1960 CAUSA purchased 2 Douglas DC-6's for a new service between Uruguay and the United States. And it recently purchased 1 Curtiss C-46 Super C and hopes to acquire another. Interocean Airways, granted certification in mid-1959, was interested in acquiring 3 DC-6B's.

U.S. aircraft are usually preferred, and the British planes in use were purchased only because of easy financing terms.

GENERAL AVIATION

More than 400 civil aircraft are used in general aviation activities. Only 15 of these planes are not U.S. made. One Cessna is used for aerial photography, 25 aircraft for crop dusting and fumigation, 5 for air ambulance services, and a total of 101 for instructional flying by the 35 flying clubs. About 271 planes are used for private or pleasure flying, 3 for business flying, 1 for air taxi operations, and 11 for Government nonmilitary activity. Most of the private aircraft registered are also engaged in some type of business flying.

MARKET POTENTIAL

The Government is now carrying out a stabilization program. It has been controlling credit, wages, and prices in its efforts to eliminate inflationary pressures. The deficit will probably not be eliminated, however.

The market for U.S. transport aircraft is limited because of the small size of the domestic air transportation industry and the acute shortage of foreign exchange. Nonoperative companies such as Interocean Airways might, however, offer a potential market for surplus aircraft if they and foreign airlines engage in a joint venture for international operations. Uruguayan law requires any national airline to be at least 51 percent controlled by domestic capital.

In September 1960, import controls and surcharge and prior deposit requirements were removed. The outlook is favorable for the sale of light planes for use by the large ranch owners and for ambulance, crop dusting, and air taxi services.

Uruguayan Civil Air Fleet—429

Commercial airlines, total	11
Compania Aeronautica Uruguay, S.A. (CAUSA)	
Short Sunderland (hydroplane)	1
Short Sandringham (hydroplane)	1
Curtiss C-46 Super C	1

Commercial airlines--Con.
Primeras Lineas Uruguayas de Navegacion Aerea (PLUNA)
Douglas DC-3..... 4
Vickers Viscount 769D..... 3
Ryan Navion..... 1

General aviation, total..... 418

Air taxi

E. Errandonea
Cessna 180..... 1

Aerial survey

Instituto Aero-Fotogrametrico Uruguayo, S.A.
Make unknown..... 1

Air ambulance

Centro de Aviacion de Salto
Ryan Navion..... 1
Cessna 180..... 1

Aero Club de Melo
Cessna 170..... 1

Aero Club de Paysandu
Beechcraft 35 Bonanza..... 1

Department of Rio Negro
Chrislea CH3..... 1

Agriculture

Direccion General de Lucha Contra la Langosta
Piper..... 7
Cessna..... 1

Grasshopper Extermination Commission
Piper J-3C-65..... 2

Lucha Contra Plagas Agricolas
Aeronca 7AC..... 2
Piper J-3C-65..... 2

Azucarera del Litoral, S.A.
Rawdon..... 1

Chadkling & Moreno
Rawdon..... 1

Compania Aerea de Fumigaciones Agricolas (CAFA)
Piper PA-18..... 7

General aviation--Con
Agriculture--Con.
Compania Uruguaya de Pulverizaciones Aereas
Piper PA-18..... 1
Rawdon..... 1

Business

Pike & Co.
Rearwin 8135..... 1

Institute Fotogramo, Ltda.
Cessna UC-78..... 1

Consejo Departmental
Piper PA-22..... 1

Flying clubs

Piper Cub (44), PA-22 (1), PA-20 (1)..... 46
Stinson 108..... 4
Taylorcraft..... 16
Rearwin 175..... 2
Luscombe 8 Silvaire (3), 11 (1)..... 4
Bucker-Jungmann..... 1
Aeronca 65 (1), 50 (3), 7AC (5), 11AC (4)..... 13
Cessna 140 (3), 170A (3), 172 (1)..... 7
Nicca..... 1
CAP* 4 Paulistinha..... 4
Ryan Navion A..... 1
Beechcraft C-35 Bonanza..... 2

Government, nonmilitary

Air Force
Fairchild PT-26..... 5
De Havilland Chipmunk..... 1
Piper AE1..... 1

Direccion Aeronautica Civil
Stinson 10..... 1

SIAM
Piper PA-23..... 1

Municipal Headquarters, Treinta y Tres
Cessna 170..... 1

Municipal Headquarters, Tacuarembo
Cessna 170A..... 1

Private

De Havilland Moth..... 2
Potez 43..... 1

General aviation--Con.
Private--Con.

Porterfield 90	1
Taylorcraft Cub (2), DC-65 (6), DC-12 (10), -20 (1)	19
Aeronca 65 (1), -7AC (3), -15 AC (2), -7EC (3)	9
Waco TKB7	1
Stinson 10 (2), -108 (18)	20
Piper J Cub (11), PA-12 (12), PA-23 (7), PA-18 (14), PA-11 (4), PA-20 (9), PA-22 (11), PA-25, -14, -15, -17 (4)	72
Miles Hawk	1
Rearwin 8135	1
Culver L.F.A	1
Douglas DC-2	1
Cessna 140 (4), UC-78 (2), 125 (1), 180 (13), 170 (5), 182 (32), 172 (23), 310 (2), 195 (1)	83
Neybar	1
Ercoupe 415	7
Beechcraft 35 Bonanza (15), 50 Twin Bonanza (1), D17S (1)	17
Luscombe 8	9
Ryan Navion	9
Globe OC-1B	4
Bellanca Cruiser	3
Stearman PT-17	1
Auster V	2
Fairchild UC-61K	1
Rawdon	2
Republic RC-3 Seebee	2
Norcersen	1

* Companhia Aeronautica Paulistha (Brazil).

Venezuela

Venezuela, having an area of more than 352,000 square miles, is the sixth largest country in South America and is one-third larger than Texas. It has a coastline of more than 1,700 miles. Approximately four-fifths of the more than 7.3 million population is concentrated in the northern and coastal regions; most of the remaining fifth is in the north central plains. Only about 3 percent of the population lives in the southeastern region, an area almost half the size of the country as a whole.

ROLE OF AIR TRANSPORTATION

Civil aviation has developed because mountain ranges, swampland, and widely dispersed centers of population have hindered the development of surface transportation. Air services con-

tribute to the overall transportation system by providing more rapid movement of passengers and cargo where surface services already exist, by serving areas where surface transportation is inadequate, and by linking centers of population and industry with isolated regions. Air cargo service is less important than air passenger service. Ocean shipping lines carry the bulk of Venezuela's foreign trade. Air cargo, though accounting for only a small part of total foreign trade tonnage, is highly important in transporting certain categories of exports and imports, such as perishables, and those items requiring special handling and speed of service.

The Government promotes civil aviation. It improves airport and air traffic control facilities, develops domestic and international passenger and cargo services, concludes bilateral aviation agreements, participates in international civil aviation organizations, and applies international standards on air operations. It has ratified the International Civil Aviation Convention and its amendments and the Warsaw Convention of 1929, and it has concluded bilateral agreements with the United States, France, the Netherlands, and Portugal.

The Ministry of Communications promotes and regulates civil aviation through the Bureau of Civil Aeronautics *(Direccion de Aeronautica Civil).* The Bureau has 3 operating divisions: National Airways, Airports, and Air Safety. The Division of National Airways carries out air traffic control procedures according to Venezuela's international air agreements. It also supervises the National Technical School of Air Control, which trains control tower operators. The Division of Airports studies the need for new airports and approach zones, plans complete airport installations, and operates all civil public airports. The Division of Air Safety examines and approves pilots and mechanics, issues air worthiness certificates and aircraft registrations, plans search and rescue operations, and controls airport firefighting services. Also reporting directly to the Bureau's Director is the Aeronautical Law Adviser, who handles all civil aviation legal matters affecting the Government. The Bureau subsidizes the Civil Aviation School, "Miguel Rodriguez", and the various air clubs located at important commercial and municipal airports.

An interministerial committee, the National Technical Council of Aeronautics, studies the problems of international air transportation and screens all civil aviation matters which will be brought before the Bureau of Civil Aeronautics. The Transport Division of the Ministry of Foreign Relations consults with the Bureau of Civil Aeronautics and other Government agencies and negotiates all bilateral civil aviation agreements. Also in this Ministry is the Bureau of International Organizations, which links the International Civil Aviation Organization with the Venezuelan Bureau of Civil Aeronautics and the National Technical Council.

AIRCRAFT IN USE

More than 420 civil aircraft were registered in Venezuela in March 1961, of which about 400 were U.S. made. The commerical scheduled and nonscheduled airlines operated about 170 of these aircraft; the balance was used in general aviation activities. Douglas, Piper, Cessna, and Beechcraft planes were the most numerous U.S. makes. The largest aircraft were Vickers Viscounts, Lockheed Super Constellations, and Douglas DC-6B's, and the newest aircraft were Fairchild F-27 turboprops. Included in the total were 26 helicopters.

COMMERCIAL AIRLINES

Service

Linea Aeropostal Venezolana (LAV) is a Government-owned and -operated airline offering an extensive network of domestic scheduled flights, most of them beginning in Caracas. More than 40 aircraft are registered in its fleet. Another national air carrier is *Aerovias Venezolanas, S.A.* (AVENSA), a privately owned line, 30 percent of which is owned by Pan American World Airways (PAA). Its scheduled domestic operations are extensive. It owns about 30 aircraft. In addition to domestic services, these companies have operated regional and international routes. In January 1961 LAV and AVENSA merged their international operations, forming a new company, *Venezolana Internacional de Aviacion, S.A.* (VIASA), which will also operate on any future international routes. VIASA has an option to buy the PAA interest in AVENSA. Both parent companies continue separate domestic operations, and AVENSA manages the new carrier. The scheduled airlines also offer domestic and international air cargo and charter flights.

Regularly scheduled cargo service is offered by privately owned *Rutas Aereas Nacionales, S.A.* (RANSA), which operates 24 aircraft. RANSA is Venezuela's most important carrier of both domestic and international air cargo, especially between Miami and Caracas. It has been operating since November 1960 under the direction and supervision of a Government-appointed legal trustee.

Linea Expresa Bolivar, C.A. (LEBCA), a U.S.-owned all-cargo nonscheduled line, has its home office in Miami. Its Venezuelan flights begin in Maracaibo. Using 9 aircraft, it primarily offers flights to Miami and chartered international sevices, but it also offers domestic charter services.

Nine privately owned nonscheduled airlines operate charter and air taxi services carrying passengers and small cargo. *Salta, C.A.*, based at Maiquetia airport and serving Caracas, is the local distributor for Cessna. It operates an overhaul service for small aircraft engines and uses about 7 aircraft. Maiquetia is also

the base for *Aerotecnica, S.A.* (ATSA), which is licensed to fly throughout the country. ATSA provides charter services, frequently for the Government. It owns and operates 13 helicopters and 1 utility aircraft. *Aeroactividades Venezolanas, S.A.* (Aeroven), at Ciudad Bolivar, Bolivar State, offers charter services in the southeastern part of the country, using 13 aircraft. The central part of the country is served by 2 small regional air taxi airlines operating from San Fernando de Apure in Apure State: Ransa, a directly owned and controlled subsidiary of the already described cargo airline of the same name, and *Aerovias Compania Anonima, S.A.* (ACASA), which owns 9 aircraft. *Taxis Aereos Nacionales, C.A.* (TANCA), formed in 1957, offers air taxi and nonscheduled cargo services and aerial photography work. Located in Ciudad Bolivar, it serves southeastern Venezuela with 9 aircraft. *Heliven, C.A.*, operates from Maracaibo in northwestern Venezuela, and serves mostly the large U.S. petroleum companies, using 5 helicopters. *Aeroservicios Bolivarianos, C.A.* (AEROBOL), was organized in 1957 to engage in exploration and inspection of certain mineral- and oil-bearing zones. It is located at Maiquetia and operates 5 helicopters. *Helicargo*, also organized in 1957, offers general charter services in the west central area of the country, using 2 helicopters.

Scheduled passenger services into Venezuela are offered by the following foreign air carriers: Air France, *Alitalia, Avianca* (Colombia), Delta Air Lines, Iberia (Spain), Royal Dutch Airlines (KLM), Pan American World Airways, Inc. (PAA), and *Real Aerovias* (Brazil). PAA and KLM are reported to carry most air cargo imports. The Government has a very active program for the development of airports and air navigation aids. The major international airports have already been expanded to accommodate anticipated heavy jet traffic. Airport control equipment and radio-teletype circuits are being installed according to the air traffic control plan for the main domestic routes.

Disposal and Reequipment Programs

In 1961, 1 Convair 880 was delivered to VIASA for its international service. VIASA will probably lease 1 or 2 more jets when it operations expand. VIASA and several foreign flag airlines now serving Venezuela with jet equipment are negotiating for pooling arrangements. LAV's 6 Constellations, which made up its overseas fleet, are not being used by VIASA and will probably be disposed of. No purchases of piston aircraft are expected. The last of 6 Fairchild F-27's on order were delivered early in 1961.

In 1960 RANSA was interested in acquiring about 3 four-engine cargo aircraft to meet the demands of its expanding international operations. A DC-6 converted to cargo use was acquired late in 1960.

Except for several De Havilland aircraft and LAV's Viscounts, practically all aircraft in Venezuela are U.S. made. The major

factors limiting the acquisition of additional aircraft by domestic commercial airlines are the availability of foreign exchange and financing terms.

GENERAL AVIATION

Almost 260 aircraft were used in general aviation activities at the end of January 1960. Thirteen aircraft were for official use, 30 for instructional flying by the 12 aero clubs, 21 for business and executive use by 13 firms, 25 for the Government-supported flying school, "Miguel Rodriguez", 36 for aerial dusting and spraying, 3 for aerial surveying and photography, and 127 for private use. In July 1959 about 50 planes were used by the Venezuelan Air Force for military transportation.

Executive planes are owned and operated by U.S. oil, iron mining, and construction companies and by certain domestic firms. Executive flying could expand considerably if large manufacturing facilities in the middle western areas of Venezuela continue to develop and if production of oil and mining in the more remote areas increase.

Private flying is limited because of the rough terrain around many of the population centers and the expense of flight training. The Government subsidizes various flying clubs through the country. Many clubs do not operate up-to-date equipment, and many of their registered aircraft are probably out of commission.

Agricultural services, although well established, are limited because of high cost.

In addition to charter air carrier services, many companies operate noncarrier services, including fire control patrols, under Government contract. One company is operating a pipeline patrol. The demand is increasing for helicopters in aerial photography and advertising, Government traffic studies, shuttle services to outlying petroleum and mining facilities, and crop dusting.

MARKET POTENTIAL

There is no immediate market for surplus piston-powered aircraft. When airports are expanded to accommodate larger aircraft and when the demand increases for domestic services, a need for larger two-engine and some four-engine equipment may develop. However, piston aircraft of these types are available in the country to meet anticipated demands. The international airline will use jet aircraft as soon as possible, and the scheduled domestic airlines will probably replace piston planes with turpoprops if demand increases.

The market outlook for aircraft and equipment depends on improvement in the country's economy. Venezuela has been having financial difficulties, partly because of lower world petroleum prices. The Government, in addition to expanding its requirement for prior import licensing of essential commodities, has instituted exchange control measures, curtailing the possibility

of trade expansion. Nevertheless, imports of aircraft and spare parts are included on the Venezuelan "List of Importations on the Controlled Market." These imports are given the most favorable rate of exchange of 3.35 bolivares per dollar. They are subject, however, to a prior import permit issued by the Venezuelan Central Bank.

Venezuelan Civil Air Fleet—425

Commercial airlines, total	169
Scheduled	93
Linea Aeropostal Venezolana (LAV)	
Lockheed Super Constellation 1049-G	6
Vickers Viscount 749	3
Martin 202	2
Douglas DC-3C	25
Douglas C-47	3
Curtiss C-46A	4
Aerovias Venezolanas, S.A. (AVENSA)	
Convair 340	5
Douglas DC-3A	4
Douglas DC-3C	5
Curtiss C-46A	2
Curtiss C-46F	1
Douglas DC-6B	2
Convair 440	2
Fairchild F-27	5
Rutas Aereas Nacionales, S.A. (RANSA)	
Beechcraft E-50	1
Curtiss C-46A	10
Curtiss C-46D	3
Curtiss C-46R5	1
Cessna 180	2
Cessna 180A	1
Douglas DC-6A	1
Cessna 180B	2
De Havilland (Canada) Beaver DHC-2	3
Nonscheduled	76
Linea Expresa Bolivar, C.A. (LEBCA)	
Curtiss C-46A	6
Douglas C-54B	1
Cessna 180	1
Howard DGA-15-P	1
Douglas C-47	2
Salta, C.A.	
Cessna 180	1
Cessna 175	1
Cessna 190	2
Cessna 180B	2
Beechcraft F-2-B	1

Commercial airlines--Con.
Nonscheduled--Con.
Aerotecnica, S.A. (ATSA)
Bell 47 (helicopter)..... 13
Cessna 190..... 1

Aeroactividades Venezolanas, S.A. (AEROVEN)
Cessna 180..... 5
Helio Courier H-391-B..... 8

Sociedad Anonima Nacional Transporte Aereo (SANTA)
Cessna 180..... 3

Aerovias Compania Anonima, S.A. (ACASA)
Cessna 180, 182..... 7
Beechcraft 35 Bonanza..... 1
De Havilland (Canada) Beaver DHC-2..... 1

Taxis Aereos Nacionales, C.A. (TANCA)
Lockheed 10A..... 1
Lockheed 12A..... 1
Cessna 170B..... 2
Cessna 180..... 3
Cessna 195..... 1
De Havilland Dove DH-104..... 1

Heliven, C.A.
Bell 47-G (helicopter)..... 5

Aeroservicios Bolivarianos, C.A. (AEROBOL)
Hiller UH-12C (helicopter)..... 5

Helicargo, C.A.
Bell 47-G (helicopter)..... 2

General aviation, total..... 256

Aerial surveys..... 3

Topografia, Ingenieria Aerofotogrametria Venezolana, C.A.
Beechcraft E-18S..... 1

Consorcio Nacional Aeromapas Seravenca, S.A.
Lockheed 10E..... 1
Douglas B-26C..... 1

Agriculture..... 36

Industria Aeroagricola, C.A. (IACA)
Piper PA-18A-150..... 9
Beechcraft K-35..... 2
Beechcraft D-18S..... 1
Cessna 180..... 2
Cessna 170B..... 1

Servicio Agropecuario Aereo, C.A. (SAACA)
Stearman PT-17..... 8

General aviation--Con.
Agriculture--Con.
Agropecuaria y Aerosperjadora-Nacional, S.A. (AYANSA)
Piper PA-18A..... 10
Boeing/Stearman A-75-N1..... 1

Fumigaciones Aereas, S.A.
Piper PA-18A..... 1
Stearman PT-17..... 1

Business..... 22

De Havilland Dove DH-104..... 3
De Havilland Heron DH-114..... 1
Douglas DC-3C..... 5
Aero Commander 680 Super..... 1
Cessna 180..... 1
Grumman G-21-A Goose..... 1
Bell 47-G (helicopter)..... 1
Piper PA-25..... 1
Beechcraft D-18S..... 2
Piper PA-18A..... 2
Piper Apache PA-23..... 1
Beechcraft D-50A..... 2
Aero Commander 560..... 1

Flight school..... 25

Escuela de Aviacion Civil "Miguel Rodriguez"
Aeronca 7EC..... 10
Vultee BT-13A..... 5
Fairchild PT-19A..... 1
Beechcraft 95..... 2
Beechcraft Mentor B-45..... 7

Flying clubs..... 30

Piper PA-18..... 15
Aeronca 7EC..... 1
Cessna 150..... 2
Piper J-3..... 2
Piper PA-14..... 1
Cessna 180..... 1
Cessna 140..... 3
Aeronca L-3-B..... 1
Aeronca L-4-H..... 1
Cessna 172..... 3

Government, nonmilitary..... 13

Ministerio de Communicaciones
Douglas C-47A..... 1
Cessna 310..... 1
Douglas DC-3C..... 1

General aviation--Con.
Government, nonmilitary--Con.
Instituto Agrario Nacional
Beechcraft D-50 1

Banco Agricola y Pecuario
De Havilland Dove DH-104 1

Instituto Venezolano de Petroquimica
Helio Courier H-391-B 1
Beechcraft E-18S 1

Ministerio de Obras Publicas
Aero Commander 680-E 1
Piper Apache PA-23 1

Corporacion Venezolana de Fomento
Piper PA-18 1

Ministerio de Agricultura y Cria
De Havilland Dove 104 1

Gobierno del Estado Apure
Cessna 180-B 1

Instituto Venezolano del Hierro y del Acero
Aero Commander 680 1

Private and charter use 127

Beechcraft 95 5
Vultee BT-13A 3
Beechcraft 35 Bonanza 15
Cessna 140 4
Cessna 170 7
Cessna 182 9
Piper PA-22 8
Cessna 172 4
Luscombe Silvaire 8F 2
North American SNJ-5-B 1
Fairchild PT-19A 1
Cessna 150 1
Champion 7-EC 1
Luscombe Silvaire 8A 1
Piper J-3C-65 1
Stinson 108 4
Swift GC-1B 3
Ryan Navion NAV-4 4
Piper PA-12 2
Ercoupe 415-C 2
Bellanca Series 14 2
Cessna 180 2
Ryan Navion A 3
Piper PA-20 4
Aero Commander 560 1
Stinson L-5C Sentinel 1
Auster J.5.4. Series F 1

General aviation--Con.
Private and charter use--Con.

Taylorcraft BC-12-D	1
Piper PA-18	3
De Havilland Dove DH-104	1
Cessna 190	1
Beechcraft 50 Twin Bonanza	4
Piper Apache PA-23	5
Piper PA-16	1
Cessna 182	1
Douglas DC-3C	1
Helio Courier H-391	3
Cessna 310	5
Camair 480	3
Cessna 175	4
Cessna 210	1
Lockheed 12A	1

U.S. Exports of Aeronautical Products to South American Countries, 1959-61

(Value in dollars)

Description and country of destination	1959		1960		1961	
	Number	Value	Number	Value	Number	Value
Aircraft, and parts and accessories, total[1]	.....	19,318,231	.....	32,601,082	.....	45,925,110
Commercial and civilian aircraft, total	352	17,134,911	535	29,107,985	648	41,979,224
Aircraft 3,000 pounds and over, empty airframe weight	56	9,225,028	65	20,641,824	71	30,340,813
Passenger transports, commercial, new:						
3,000-14,999 pounds	2	162,867	14	1,409,867	16	1,711,279
Argentina	.....	.....	1	99,851	9	1,026,225
Bolivia	.....	.....	.....	.....	1	112,980
Brazil	2	162,867	8	817,722	2	172,883
Chile	.....	.....	1	78,177	2	182,500
Peru	.....	.....	2	156,000	1	153,965
Uruguay	.....	.....	1	107,700	.....	.....
Venezuela	.....	.....	1	150,417	1	62,726
30,000 pounds and over	4	4,503,700	2	11,328,618	5	20,711,747
Brazil	4	4,503,700	2	11,328,618	2	11,714,938
Colombia	.....	.....	.....	.....	2	5,101,809
Venezuela	.....	.....	.....	.....	1	3,895,000

U.S. Exports of Aeronautical Products to South American Countries, 1959-61—Con.

(Value in dollars)

Description and country of destination	1959		1960		1961	
	Number	Value	Number	Value	Number	Value
Commercial and civilian aircraft--Con.						
Aircraft 3,000 pounds and over--Con.						
Rotary wing aircraft, commercial, new	.....	.....	2	278,580	3	506,710
Argentina	.....	.....	1	107,225	.....	.....
Chile	.....	.....	1	171,355	3	506,710
Commercial and civilian aircraft, used and rebuilt, including converted	50	4,558,361	47	7,624,759	47	7,407,182
Argentina	13	1,548,055	10	2,200,000	11	1,937,567
Bolivia	.....	.....	4	668,500	1	52,750
Brazil	9	525,000	6	516,000	6	1,700,000
Chile	7	162,500	1	480,759	6	1,590,500
Colombia	10	1,639,937	8	724,000	4	223,000
Ecuador	.....	.....	2	650,000	1	175,000
Paraguay	3	123,000	.....	.....	2	71,150
Peru	1	38,920	9	1,380,500	7	1,051,900
Uruguay	.....	.....	.....	.....	2	89,150
Venezuela	7	520,949	7	1,005,000	7	516,165
Commercial and civilian aircraft under 3,000 pounds:						
Utility, 3 places and under, new	111	1,512,547	83	783,013	111	952,090
Argentina	39	867,271	28	263,541	47	423,457
Bolivia	.....	.....	2	22,750	.....	.....

Brazil	3	20,930	.....	.....	4	37,589
Chile	5	37,302	7	49,517	28	190,524
Colombia	44	428,236	21	206,610	6	73,845
Ecuador	4	36,265	14	134,540	8	78,000
Paraguay	4	22,640	.....	.....	.....	.....
Peru	5	43,425	3	17,559	2	16,000
Uruguay	2	18,000	3	47,400	10	85,678
Venezuela	5	38,478	5	41,096	6	46,997
Utility, 4 places and over, new	150	2,857,231	324	5,989,333	417	8,853,911
Argentina	47	850,895	145	2,316,036	194	4,748,572
Bolivia	3	68,394	3	42,470	1	17,451
Brazil	28	505,483	93	1,789,641	85	1,415,173
Chile	24	407,406	23	546,912	34	440,170
Colombia	12	153,094	5	101,832	11	248,063
Ecuador	1	13,000	5	62,329	16	420,979
Paraguay	7	101,298	5	126,006	11	171,930
Peru	2	82,000	8	139,147	14	162,977
Uruguay	7	127,135	15	316,632	18	309,620
Venezuela	19	548,526	22	548,328	33	918,976
Rotary wing, commercial, new	9	505,505	22	1,218,689	28	1,495,035
Argentina	.....	.....	1	80,730	9	569,798
Bolivia	.....	.....	1	2,660	.....	.....
Brazil	2	132,246	15	843,472	3	238,960
Chile	.....	.....	4	223,800	3	146,535
Colombia	1	27,000	.....	.....	9	513,052
Ecuador	.....	.....	1	68,027	.....	.....
Peru	.....	.....	.....	.....	1	2,700
Uruguay	.....	.....	.....	.....	2	20,479
Venezuela	6	346,259	.....	.....	1	3,511

U.S. Exports of Aeronautical Products to South American Countries, 1959-61—Con.

(Value in dollars)

Description and country of destination	1959		1960		1961	
	Number	Value	Number	Value	Number	Value
Commercial and civilian aircraft, total--Con.						
Commercial and civilian, etc.--Con.						
New, not elsewhere classified (all empty airframe weights)	2	2,807,500	.....	.....	1	910
Brazil	2	2,807,500	.....	.....	.....	.....
Peru	.....	.....	.....	.....	1	910
Used and rebuilt, including converted	24	227,200	41	475,126	20	336,465
Argentina	4	39,788	3	27,250	3	58,215
Bolivia	4	58,762	2	28,750	.....	.....
Brazil	2	10,500	4	19,500	.....	.....
Chile	3	3,200	.....	.....	1	6,400
Colombia	3	28,000	6	156,560	3	96,050
Ecuador	3	25,500	9	107,926	3	750,000
Peru	.....	.....	12	93,640	2	12,000
Uruguay	1	25,000	3	24,000	7	78,800
Venezuela	4	36,450	2	17,500	1	10,000
Aircraft engines under 400 horsepower, including new, used, and rebuilt, total[2]	576	2,183,320	783	3,493,097	779	3,945,886
Reciprocating, new, air-cooled	213	533,211	244	669,840	289	773,968
Argentina	59	97,610	62	199,534	80	245,101
Bolivia	2	5,628	5	16,576	10	38,916

Brazil	70	144,565	79	201,946	120	228,154
Chile	16	86,786	6	15,796	20	64,052
Colombia	27	66,172	24	62,308	18	59,754
Ecuador	13	35,298	36	82,512	10	29,047
Paraguay	5	16,575	2	6,861	1	8,570
Peru	5	11,500	6	16,323	5	26,025
Uruguay	1	1,487	3	5,958	10	23,352
Venezuela	15	67,590	21	62,026	15	50,997
Reciprocating, used and rebuilt	363	1,650,109	539	2,823,257	490	3,171,918
Argentina	20	86,579	65	392,902	54	326,671
Bolivia	46	184,674	58	212,158	26	192,647
Brazil	39	260,170	140	1,044,002	91	882,845
Chile	9	47,300	13	55,113	32	294,235
Colombia	92	445,347	103	505,409	96	462,128
Ecuador	20	57,313	18	46,791	20	80,179
Paraguay	1	2,000	6	32,580	7	36,075
Peru	29	112,250	34	137,125	53	336,181
Uruguay	8	30,500	6	25,083	9	28,698
Venezuela	99	423,976	96	372,094	102	532,259

[1]Totals are not all inclusive because data by country are not available on many items of components.

[2]Number and value of new engines over 400 horsepower are not available by country of destination, but are included in total parts and accessories exported from U.S. in table U.S. World Exports of Aeronautical Products, 1959-61.

Source: Report No. FT-410, Part II, U.S. Exports of Domestic and Foreign Merchandise, Bureau of the Census, U.S. Department of Commerce.

U.S. World Exports of Aeronautical Products, 1959-61

(Value in dollars)

Description	1959		1960		1961	
	Number	Value	Number	Value	Number	Value
Aircraft, and parts and accessories, total	.....	768,980,000	.....	1,329,343,000	.....	1,237,758,802
Commercial and civilian aircraft, total	1,628	152,962,000	2,336	537,126,000	2,460	338,677,833
Parts and accessories, total	.....	616,018,000	.....	792,217,000	.....	899,080,969
Aircraft engines, reciprocating, new, aircooled, under 400 horsepower	948	2,448,000	1,464	3,715,000	1,575	4,398,711
Aircraft engines, reciprocating, used and rebuilt	1,250	4,846,000	1,558	10,392,000	1,574	11,684,010
Aircraft components, parts, and accessories, not elsewhere classified[1]	.....	608,724,000	.....	778,110,000	.....	882,998,248

[1]Includes air-cooled reciprocating engines, new, 400 horsepower and over, and military aircraft.

Source: Current Industrial Reports, Complete Aircraft and Aircraft Engines, Bureau of the Census, U.S. Department of Commerce, and Federal Aviation Agency.

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